



CHEETAL

JOURNAL OF

The Wild Life Preservation Society of India

Vol. 13

March 1971

No. 2

Photo by: S. R. Choudhery



Wild Life Preservation Society of India

1. The aims and objects of the Society are as follows

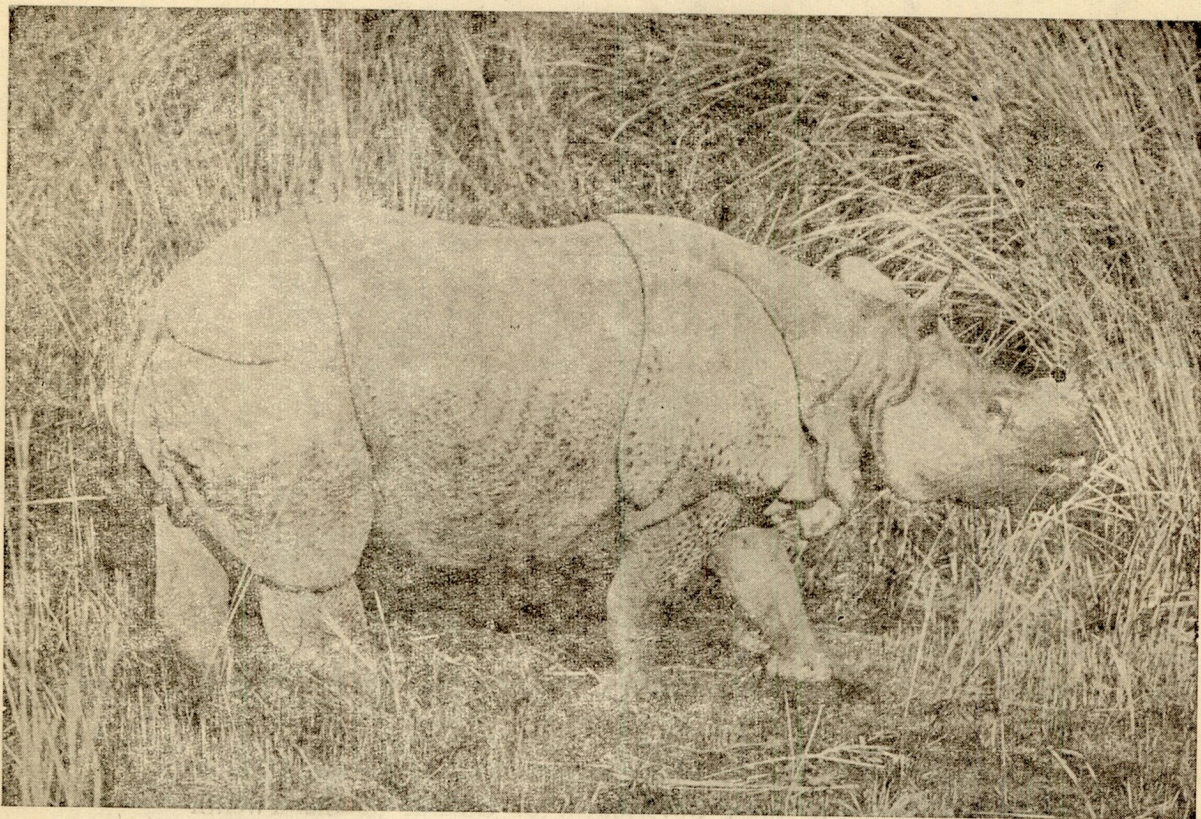
- (a) To promote interest in and impart knowledge regarding the preservation and conservation of all forms of wild life, particularly among the youth of the country.
- (b) To co-operate with the Govts. of India and States and with other Societies and Institutions having similar aims and objects in working for the interests of wild life.
- (c) To assist in enforcing and actively supporting the Forest Acts, Wild Birds and Animals Protection Acts and Rules etc. of States and the Indian Arms Act and Rules in so far as they pertain to wild life and to bring to the notice of the authorities any infringement of the same and to assist in the detection and prosecution of offenders in respect of such laws.
- (d) To advise and help the Govt. and wild life administrators in the formation, maintenance and protection of Sanctuaries and National Parks, the preservation of wild life in general and rare species of India in particular and in the introduction of exotic species into the country, the rehabilitation of rare species etc. and in the revision on rational lines of the shooting and fishing rules, so as to conserve and increase wild life stocks.
- (e) To raise funds for the carrying out of the above aims and objects and to found and maintain museums, reading rooms and libraries of natural history in order to disseminate knowledge regarding wild life.
- (f) To promote sportsmanship in shikar and to recognise well regulated shooting and fishing, as a means of preserving wild life and fish so that through wise use the surplus may provide a recreational asset to the nation.
- (g) To carry out publicity and propaganda for the preservation of wild life in India by means of monographs, journals, films, film strips and other feasible methods.
- (h) To assist members of the Society in obtaining shooting and fishing facilities and facilities for viewing and photographing wild life in India.
- (i) To conduct research into the problem of Wild Life management in India, and in pursuance of this, to initiate, encourage and, where possible, assist in projects for the study of threatened species and related subjects and to provide reference and research facilities for such work
- (j) To carry on such other activities which will serve the above subjects.

What membership of Wild Life Preservation Society of India will entitle you to ?

1. You will become an active member of the growing number of Wild Life enthusiasts, who enjoy working for and spreading the knowledge of how to conserve India's heritage of Wild Life for posterity.
2. You will be entitled to the full use of the Library of the Wild Life Preservation Society and of its reading room.
3. You will receive a membership certificate.
4. You will receive a personal Identification and Membership card.
5. You will be entitled to buy all publications of the Society at a concession rate.
6. You will be entitled to buy at concession rates the Society's Greeting Cards, Calendars, Tie, Lapel badge and the Balance of Nature Game (specially Published in colour for its educative and recreational value).
7. You will be supplied "Cheetal", the half yearly journal of the Society free.

CONTENTS

	PAGES
1. Editorial	1
2. About Ourselves	3
3. A Preliminary Ecological Survey of the Periyar Wildlife Sanctuary, Kerala State by G.U. Kurup	5
4. With the Tiger-Tracer by S.R. Choudhury, I.F.S.	19
5. Winter Track Census Survey of Wild Life of Palamau National Park by J. Mishra, I.F.S.	26
6. Speech delivered by Lt. Col. Fatesinghrao Gaekwad of Baroda, Minister for Health, Fisheries & Jails, Government of Gujarat at the Twelfth Annual General Meeting	33
7. Himalayan Wood Pigeon by S.M. Osman	38
8. Hope Still Survives in the North by Arjan Singh	40
9. Winter Track Count of Palamau National Park— Some Suggestions for Refinement by S.R. Choudhury	44
10. IUCN Statement on Banning of Tiger Hunting	46
11. Panther On The Tree	48
12. नर : शतगुण कामम्—रमेश वेदी	49
13. वन्य जीवन संरक्षण—सी० एल० भाटिया व जे० एच० देसाई	55
14. Letters to the Editor	59
15. Open Letters	62
16. Library	65
17. List of Members	67



Welcome to :

JALDAPARA WILD LIFE SANCTUARY

Best time to visit—NOVEMBER TO APRIL

Situation—Alipur, Jalpaiguri District, West Bengal.

Scenic Beauty—River Torsa with nine Tributaries flows through the riverine forest of the sanctuary.

Wild Life Attraction—See the world famous Indian one-horned Rhinoceros in natural habitat and also elephants, Royal Bengal Tigers, Panthers, Bison, Sambhar, Cheetal and India's National Bird—the Peacock and a variety of Bird Life.

Area—Thirtysix sq. miles near Bhutan border.

Railway Station—Hashimara—only two km. from Tourist Bungalow, Barodabri.

Air Strip—Hashimara, Bi-weekly Air Service from Calcutta. Motor from Cooch Behar or Bagdogra on Air Service from Calcutta.

Forest Department Jeep and Elephants available to tourists on hire,

Accommodation—Modern Tourist Bungalow with catering arrangements at reasonable charges of Rs 15/- per day per person inclusive of Lodging, Bed Tea, Breakfast, Lunch, Afternoon Tea and Dinner.

*Information and Reservation from:—THE DIVISIONAL FOREST OFFICER,
Cooch Behar Division, P.O. Cooch Behar (W. Bengal),*

Telephone : Cooch Behar 27.

Wild Life Preservation Society of India

VOL. XIII

MARCH 1971

No. 2

Editorial

The eagerly awaited Report of the Expert Committee on Wildlife Conservation in India was made available to us after the previous issue of the CHEETAL had been printed.

It would be recalled that Government of India, at the instance of the Indian Board for Wildlife had set up an Expert Committee "to examine the existing National Parks and Wildlife Sanctuaries in the country, suggest suitable measures for their development and improvement and advise on setting up additional Wildlife Sanctuaries and National Parks in suitable areas". The terms of reference of the Committee were broadened to include, among other important issues, suggestions for a policy for wildlife conservation, a study of the problem of grazing by domestic cattle in national parks and sanctuaries, preparation of a blue-print for a wildlife wing to be set up at the Centre and in each State, the setting up of suitable Research Stations for Wildlife, at the Centre as well as State levels and to examine how best to ensure effective commercial operational economics for existing parks and sanctuaries so as to obtain the maximum benefit from the world "tourist explosion". The terms of reference were comprehensive and laid a heavy burden on the shoulders of the Committee, which had to submit its report within ten months.

All who have read the Report would agree that the Committee had carried out its task admirably. That the members were able to give so much of their time to the extensive tours involved in visiting so many existing and potential Parks and Sanctuaries, is commendable. The Report contains some excellent material, is full of information and has a comprehensive list of the existing National Parks and Sanctuaries in India. The information has been well presented and the Report is an invaluable document for those interested in wildlife conservation in India.

A detailed study of the Report would, however, show that there are a number of factual mistakes. Figures have been quoted without any rational basis. In the Chapter on Finance, little has been done to examine the actual and potential economic viability of some of the existing National Parks and Sanctuaries. No doubt the percentage area devoted exclusively

to wildlife conservation is low compared to other countries, but our problems are also vastly different. This is not to imply that we should not devote additional areas exclusively to wildlife conservation but the justification has to be made on more rational grounds.

The Report was discussed at a meeting of the Indian Board for Wildlife in November 1970. A lot of heat was generated on the issue of a separate administrative organization for wildlife conservation. It is very unfortunate that this was so, for no conclusions were reached and a decision was postponed. There is no gainsaying that under the present set-up, little or nothing is being done for wildlife in the country. The forest departments of the States, will not deny this and would also agree that more positive action has to be taken immediately if our wildlife population is not to disappear. Some States have a wildlife wing in the Forest Department but the officers of this wing have little or no executive control. It is imperative that the Wildlife Wing be developed into a more important functional unit with greater powers. This can only be done if the status of the officer-in-charge of the Wing is raised to that of at least an Additional Chief Conservator of Forests. While it is appreciated that the Forest Departments find it difficult to justify the expansion of the Wildlife Wing on economic grounds, is this because they themselves are not adequately convinced that the Wing has to be given greater importance? If so, the Forest Department should entrust the welfare of wildlife to a body or organization more willing and determined to undertake this responsibility.

The recommendation of the Committee that an organisation, for research on problems connected with wildlife be set up, should be followed up. Under the present set up there is no reason why this cannot be done at the Forest Research Institute and Colleges, Dehra Dun, where a training programme for wildlife specialists is now being conducted. The staff and trainees of this Course could initiate and follow up such research projects as are considered of importance on a priority basis, if they are given time to do so. Research projects in this field could also be developed in Universities where interested students are available. Government of India and State Governments could also consider the feasibility of offering scholarships for research projects under the Universities. This is done in foreign countries and should be possible in this country too.

About Ourselves

Members of the Society would be gratified to know that we have received a recurring grant of Rs. 5,000 per annum from the Department of Tourism, Government of India, towards the publication of the CHEETAL. We are indeed grateful to Government of India for this generous grant. The CHEETAL was being published at considerable financial loss and it would not have been possible to continue its publication without this generous assistance. However, one of the conditions of the grant is that the Journal be published quarterly. This obviously raises the cost of printing and stationary and therefore the Executive Board have decided to raise the annual subscription by Rs. 3 with effect from 1st April 1971. We hope to improve the get up of the Journal in the coming issues.

* * * *

The Editorial Board was diffident to make the Journal a quarterly because of the poor response to the plea for more and better articles. However, we are optimistic and hope that our persuasions will bear fruit. We request readers not to hesitate in sending us news and notes, if not articles, on wildlife, and its conservation.

* * * *

The Annual General Body Meeting of the Society was held on the 2nd November 1970. His Highness the Maharajah of Baroda was the Chief Guest and delivered an inspiring address which was rich in subtle humour. The address has been printed elsewhere in the Journal for the benefit of those who could not be present at the Meeting.

* * * *

In the preceeding issue of the Journal, we published an open letter from Shri Imam, a member of the Society, to the Prime Minister. This letter gives the 'other side of the picture' and it raised a controversy which it was intended to. The response to this letter from our readers has been poor, but the I.U.C.N. News Bulletin of October-December 1970 contained an article on the subject. This article is reprinted in this issue, because it was felt that it would be of interest to those of our readers who do not get to see the I.U.C.N. News Bulletin.

LAND WHERE BIRDS SING
AND TIGERS ROAR



CORBETT NATIONAL PARK

Situated in the Foothills of Himalayas - 180 Miles from Delhi. Connected by Rail & Roads; Tiger; Elephant; Deer Species; Panther; Sloth Bear; Crocodiles; Colourful & Song Birds; Vast Savannas; Picturesque Landscape; Healthy Climate; Mahaseer Fishing; Electricity; Running Water; Sanitary Pittings; Bedding; Boarding; Elephant Ride; Guide Service.

FOREMOST PARK IN THE COUNTRY WITH MAXIMUM
COMFORTS AND VARIETY OF WILD LIFE

RESERVATIONS:

- (1) CHIEF WILD LIFE WARDEN,
17, RANA PRATAP MARG, LUCKNOW
PHONE 24434 - GRAM, WILD LIFE
- (2) TOURIST OFFICER, U.P. NIWAS
3, KAUTILYA LANE, CHANAKYAPURI, NEW DELHI
PHONE No. 75782, 72806

A Preliminary Ecological Survey of the Periyar Wildlife Sanctuary, Kerala State

by
G.U. KURUP

Zoological Survey of India, Madras

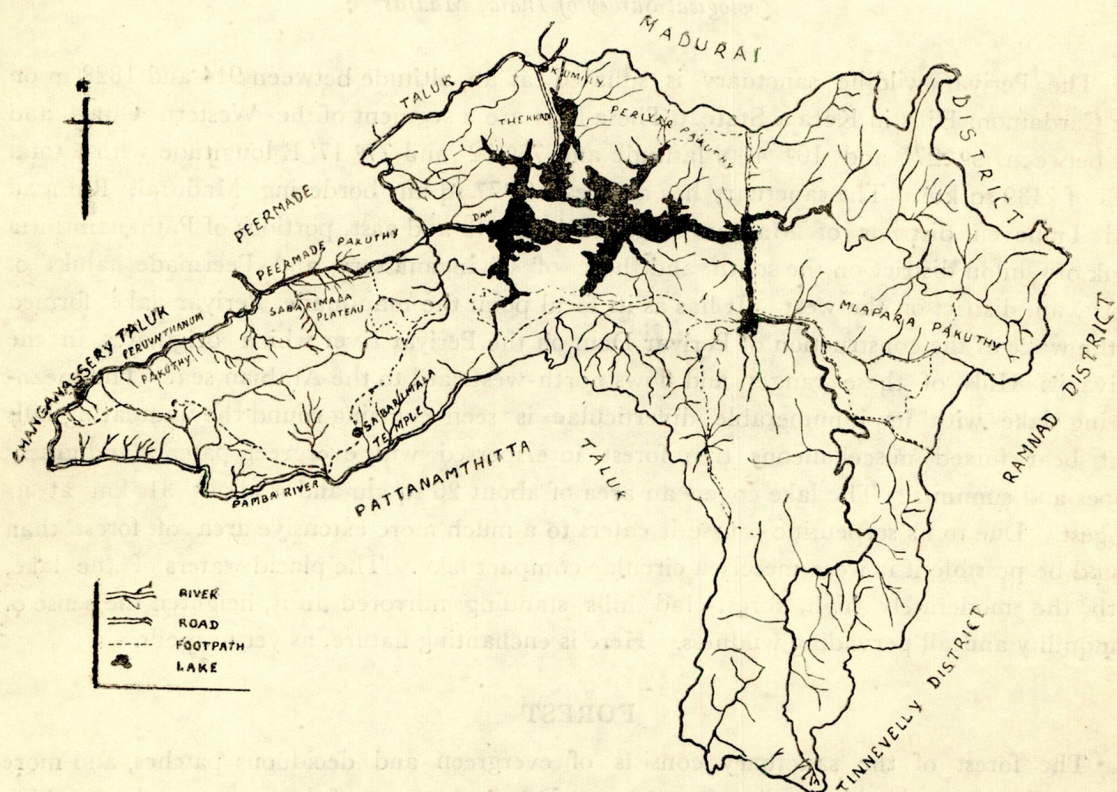
The Periyar wildlife sanctuary is situated at an altitude between 914 and 1828 m on the Cardamom Hills in Kerala State. These hills are a segment of the Western Ghats and lie between 9° 27' and 10° 4' N latitude and 76° 52' and 77° 17' E longitude with a total area of 2439 sq km. The sanctuary has an area of 777 sq km bordering Madurai, Ramnad and Tinneveli districts of Madras State on the north and east, portions of Pathanamthitta taluk of Quilon district on the south, and those of Changanassery and Peermade taluks of Kottayam district on the west. It has as its focal point the man-made Periyar lake formed in the wake of the construction of Periyar Dam on the Periyar river which originates in the Shivagiri Hills of these ranges and flows north-westward to the Arabian sea. The meandering lake with its innumerable diverticulae is seen coursing round the undulating hills that bear mixed miscellaneous tree forest interspersed with evergreen patches and grassy slopes and summits. The lake covers an area of about 26 sq km and is about 31 km at its longest. Due to its serpentine course it caters to a much more extensive area of forest than would be possible if it were merely a circular compact lake. The placid waters of the lake, with the moderately high, forest-clad hills standing mirrored in it, heighten the sense of tranquility and all-pervading wildness. Here is enchanting nature, as yet unspoilt.

FOREST

The forest of the sanctuary consists of evergreen and deciduous patches, and more extensively the mixed miscellaneous type. Dominant trees of the evergreen forest which form the climax are:

Artocarpus hirsuta
Trewia nudiflora
Machillus spp.
Eugenia spp.
Terminalia spp.
Tectona spp.

Dalbergia spp.
Polyalthia spp.
Myristica spp.
Caurica spp.
Hopea parviflora
Diospyros spp.



The understorey is mainly composed of species of *Strobilanthus*, *Glycosmis*, *Pentaptycha*, *Curcuma* and *Calamus*. The undergrowth includes *Pellonia heyneana*, *Ixora* sp., *Ophiorrhiza mungo*, *Knoxia* sp., *Selaginella*.

The deciduous forests consist of:

Terminalia spp.

Salmalia malabaricum

Dillenia sp.

Careya arborea

Pterocarpus marsupium

Lagerstroemia lanceolata

The understorey has: *Bambusa arundinacea*, *Zizyphus oenohloea* and *Cassia fistula*.

The mixed miscellaneous tree forest is largely an admixture of the above types and the predominant trees here include:

Grewia tiliaefolia

Pterocarpus marsupium

Machilus macrantha

Actinodaphne madraspatna

Tectona grandis

Terminalia sp.

In addition there are extensive grasslands on the summits and upper slopes of the hills above 1300 m, especially around the upper reaches and catchment areas of rivers.

The Periyar and Pumba rivers and their various tributaries, all having their origin in the various peaks of the Cardamom Hill ranges contribute to the sustenance of the sanctuary.

Geology

The archaen rocks of these Ghats comprise gneisses and granites. Laterite is found on the western side; in many places as a laterite plateau deeply incised by the west-flowing rivers and providing picturesque escarpments. Soil is loamy with an admixture of humus and is generally deficient in nitrogen and phosphorous content.

Climate

The average maximum temperature is 85.1° F. and minimum 59.9° F. The average rainfall is 203 cm. The south-west monsoon bursts at the end of May and is heaviest in June. There are on the average about 100 to 150 rainy days in a year and the annual variation in rainfall is not much, ranging from 77% to 140% of normal. Humidity is high though less so from December to May.

SURVEY

As we had only slightly less than a month to spend in this sanctuary (in March 1969) it was thought best to divide the sanctuary in to two major sectors and visit only the mos

representative areas in both. Thus the sanctuary was divided into a by-lake sector, encompassing the area around the lake near Thekkady, and an off-lake sector, which included areas far removed from the lake. For the latter, the forest around Sabarimala was selected in view of the accessibility and also the presence of plantations of rubber, eucalyptus, etc., which provide a contrasting environment to that of the by-lake sector. In the by-lake sector different areas were reached by boat, from where a number of transects were made, trekking back to camp at Thekkady. The off-lake sector had to be traversed by foot only, and this proved more difficult. Consequently the survey here could not be as representative as in the by-lake sector. But even so there is no doubt that the by-lake sector contained a better representation; in fact, almost a concentration of the wild life compared to the off-lake sector, at this time of the year. January is the month of least rainfall in the sanctuary and from that month onwards the localization of wildlife around available water sources, commences. The lake being by far the biggest source of water in the area, there is naturally the biggest localization around it in the by-lake sector. However more than the pattern of distribution of wildlife, the present status of the principal species of wildlife was sought to be studied. The major species of attraction in the sanctuary are the elephants, the gaur, the deer species, especially sambar, and the large carnivora. These are separately dealt with in the general perspective of the overall ecological balance in the sanctuary.

Elephant

The elephant is the dominant species of wildlife in Periyar sanctuary. Their dominance is easily seen in the by-lake sector where large herds comprising of several family units seemed to be ubiquitous, especially near the grassy peripheral belt around the lake which, at this time, is considerably exposed as the water level had receded considerably. This fact seems to have led forest officials to assume that the elephant population in the sanctuary is increasing at a fast rate. This assumption is of course in conformity with the widely prevalent misconception that the elephant population is rapidly increasing in all its traditional habitats in India. A closer look at the herd composition and specifically the immature-adult ratio it represents, will immediately show that if the elephant population in Periyar sanctuary is any guide, the species in India is facing a population crash and not a population explosion. Table 1 gives the herd composition of elephants in the sanctuary.

It would be readily seen that the proportions of immature individuals to that of adults is very low in all the herds. These herds are obviously family units which in fact can be taken as a microcosm of the total population structure. Thus taking all the herds together, the percentage of immature animals in the population works out to be 29% and a ratio of about 8 immature ones to every 10 cows. It is needless to stress that this ratio indicates a

significantly declining population (It may be noted here that the percentage of calves is only 20, that of male adults 30, and female adults 50, in the case of elephant population in Uttar Pradesh—Singh, V.B. 1969, J. Bombay nat. Hist. Soc. 66 (2) :239-250). The low juvenile proportion indicates a natural state of reduced natality which is a manifestation of the working of the innate self-regulatory mechanism of population control in a given species. In the African elephant this mechanism is shown to be working through the immediate physiological lowering of fertility level and a relatively slower process of reduced growth rate and delayed sexual maturity. The lowered fertility level is indicated visibly in the population by the longer mean calving interval and to a lesser extent by variations in the peak of the breeding period. The reduced growth rate and delayed breeding age can of course be inferred. The environmental effect on the physiological mechanism of reproduction in the Indian elephant has not been studied, but some idea can be obtained by adapting and approximating certain basic data obtained in the case of the African elephant. Thus if we assume a potential pubertal age of 12 years and a parturition-conception interval of about 3 years (11 years and 33.5 months respectively for the African species) we can calculate the optimum mature female—immature ratio. Fixing a gestation period of 20 months and rounding it off to two years and allowing for a calf mortality as high as 30% to include all possible hazards, the ratio should be 1 : 2.7 in a herd of 20 to 25 years age structure. As against this, the prevailing mature female—immature ratio is 1 : 0.8 among Periyar elephants. The potential pubertal age and parturition—conception interval, in other words, retarded breeding age and longer calving interval thus obviously account for the disparity in the ratios.

The biological self-regulatory mechanism of population control is thus shown to be already operative in the Periyar population. Such homeostatic mechanism is unleashed in a species whenever the population density is threatening the stability of the population. It can be easily seen that the increased manifestations of elephant presence is not due to a population increase but merely due to the population density in the general context of declining area of forested habitat all around, and of effective habitat even within the sanctuary. Extensive habitat changes by overgrazing and the resultant nutritional deficiency on the one hand, and the increased behavioural stresses are the two direct results of population density. Any one of these can switch on the mechanism of innate biological population control. Such a mechanism was evolved as the only means of maintaining the population stability in an animal like the elephant with its predator independence and high longevity, both of which make the elephant impact on the ecosystem a particularly severe one. However, the continued operation of this mechanism beyond the need, was formerly offset by the "safety valve" of migration which relieved the density and "defused" the mechanism. But in the current context of settlement expansion and all its paraphernalia in the sanctuary and,

for that matter throughout their habitat in India, elephant accessibility to a wider forest area is reduced. In and around the Periyar Sanctuary, estates and plantations of various types are expanding, giant scale hydro-electric projects are constructed and more and more areas are opened up by roads. The defusing factor of migration being greatly hampered, the delicate homeostatic mechanism is overloaded. The result is faster decimation and eventual crash of population.

The increasing population density of the elephant has not yet caused any large scale habitat changes in Periyar Sanctuary, and therefore the other effect, namely the psychological stress factor must be the immediate reason for the initiation of the above discussed biological regulation of population control. But the habitat changes are an eventual certainty leading to progressive forest deterioration into grass and bushland if any more inroads into the total area are allowed. The elephant has been proved to be a major agent along with fire and human settlements, in the conversion of forest into grassland in Africa. There is no reliable record of the food consumption of the Indian elephant in the wild; in captivity it is said to be 270 to 320 kg which is probably more than in the wild. Unlike its African counterpart, the Indian elephant probably consumes more bark and browse and therefore the wastage and the habitat destruction wrought by the latter is more for the simple reason that its habitat consists of more forest than grassland in India. We can therefore gauge the huge amount of primary productivity required to sustain any large elephant population. If we remember that the life span of this species is in the order of half a century and more, and that it is unaffected by predation, we can well see that it is quite capable of altering its habitat even within the duration of a single generation. And for the same reason the innate population regulatory mechanism in itself cannot prevent, in time, forest deterioration because it acts through a succession of generations, by which time an irreversible forest deterioration might have set in.

It is therefore incumbent upon all concerned to prevent any more settlement or plantation encroachment into this sanctuary. Even for the present a scientific evaluation-study of the carrying capacity vis-a-vis the present population of elephants should be undertaken and if the latter is found in excess then a culling or cropping quota should be fixed to eliminate the excess in order to make the remaining population viable.

Gaur

The next major species of wildlife in the Sanctuary is the gaur (*Bos gaurus gaurus* H. Smith). The population of this animal is said to be declining and it appears to be true. It was told by many, that haunts frequented by the gaur in the past are devoid of them now. We visited many such places and this seemed to be so. They are said to be seen in previously unlikely places. The vicinity of Edappalayam and Manakkavala inspection huts

were especially reported to be favourite haunts, but in both places we saw only herds of elephants and not gaur. Only very small herds may now be seen in unexpected places. Competition between the elephant and the gaur was suggested by the forest officials as a probable cause for the decline of gaur. But this does not seem to be a potent reason due to various factors. As a matter of fact, having the same feeding time and territory, gaur and elephants are usually co-feeders and it is not uncommon to see them feeding in the same vicinity. But what is generally not realised is that they are also complementary feeders. Even when they feed in the same vicinity there is a differential feeding preference in regard to the grass species consumed which is largely dictated by the difference in their feeding methods. The elephant feeds on tall grass which it often breaks up at its base or uproots in sizeable bunches and delivers to its mouth after knocking off the root soil against its knee. But gaur is more a closer-to-ground feeder, usually at about 5-6 cm above ground, biting off the short shoots of creeping or short-stemmed grasses, with its incisors. So the species of grass the two prefer might in all possibility differ although there may be some overlap during the pinch period. Uprooting and shortening of the grasses, in turn enhances the species diversity of the grassland by encouraging the growth of mat-forming and other shorter varieties of grass, preferred by other species.

We have therefore to look elsewhere for the decline in the gaur population. It appears that the behavioural stresses generated by the increasing population density of the elephant could very well be a major reason. The part played by physiological heat stresses and similar behavioural stresses in population stability and balance of a species, is being increasingly recognised. These stresses could generate inhibitive factors in the psychological makeup of the adult animal and reduce both the breeding urge and the potential. In infants this could reduce the resistance power and bring about increased calf mortality. While evidence of the operation of such stresses is more intangible and requires adequate study over a period of time they cannot be ruled out as a factor in the gaur decline. Harassment by the wild dog, especially to their calves may be another contributory factor.

Wild Dog predation and the Herbivore population.

Predation by the wild dog [*Cuon alpinus dukhunensis* (Sykes)] is nevertheless quite tangible and has become a grave problem in the sanctuary. The devastating efficiency of the wild dog as a population decimator can be seen from the fact that it has already wiped out the spotted deer from this sanctuary. There is not even a sight record of this deer for the last twenty years though the species is known to have existed here in the recent past, according to earlier records. Next in the list is sambar, and there are clear signs to show that a heavy toll is taken of them by the dogs. There is of course some mitigation for the sambar, as it is, mainly a nocturnal feeder unlike the spotted deer which feeds in the early and late parts of

the day as well as during the night. But wild dogs can track their prey by scent and flush them out of cover. Thus at least one sambar death was reported in the immediate vicinity of the lake while many naturally must go unreported as these kill reports are by chance sight only. This area is only a fraction of the sanctuary, so the terrible toll of sambar taken, can well be imagined. An assault group of 100 to 150 dogs is said to be common around the kill and one range officer informed me that at such times the entire area would seem to be teeming with these animals. Even after allowing for exaggeration, this gives sufficient cause for concern. If the wanton predation is unchecked, it will be only a matter of few years for the sambar to become extremely rare.

The deadly efficiency of the wild dog in tracking down and reaching their prey is revealed by the fate that befell the spotted deer when attempts were made to reintroduce it. A few of these deer were released on an island in the lake and the place was promptly named as "Deer Island". Being an island it was thought to be beyond the dogs. But in no time, wild dogs in sizeable packs swarm across the narrow stretch of water, made short work of the deer, and promptly returned. It was not realized that although wild dogs as a rule do not attack their prey in water yet they can swim considerable distances to reach the prey.

Larger Carnivores

Tigers and panthers must necessarily be few in numbers, as their principal prey, sambar, is subject to intensive predation by wild dogs. Forest officials have no reliable estimates. Judging from the reported sighting localities, obtained after local enquiries, it appears that a truer figure will be about ten tigers, working out to one tiger per 78 sq. km. of the Sanctuary.

As regards panthers, it is anyone's guess. Most of the adverse factors in regard to the tiger status are applicable to panthers as well, but probably to a less degree due to their greater adaptability and resourcefulness.

The relative status of the major faunal species of the Sanctuary, as also their ecological range, are given in tables 2 and 3.

DISCUSSION

Restoration of the ecological balance

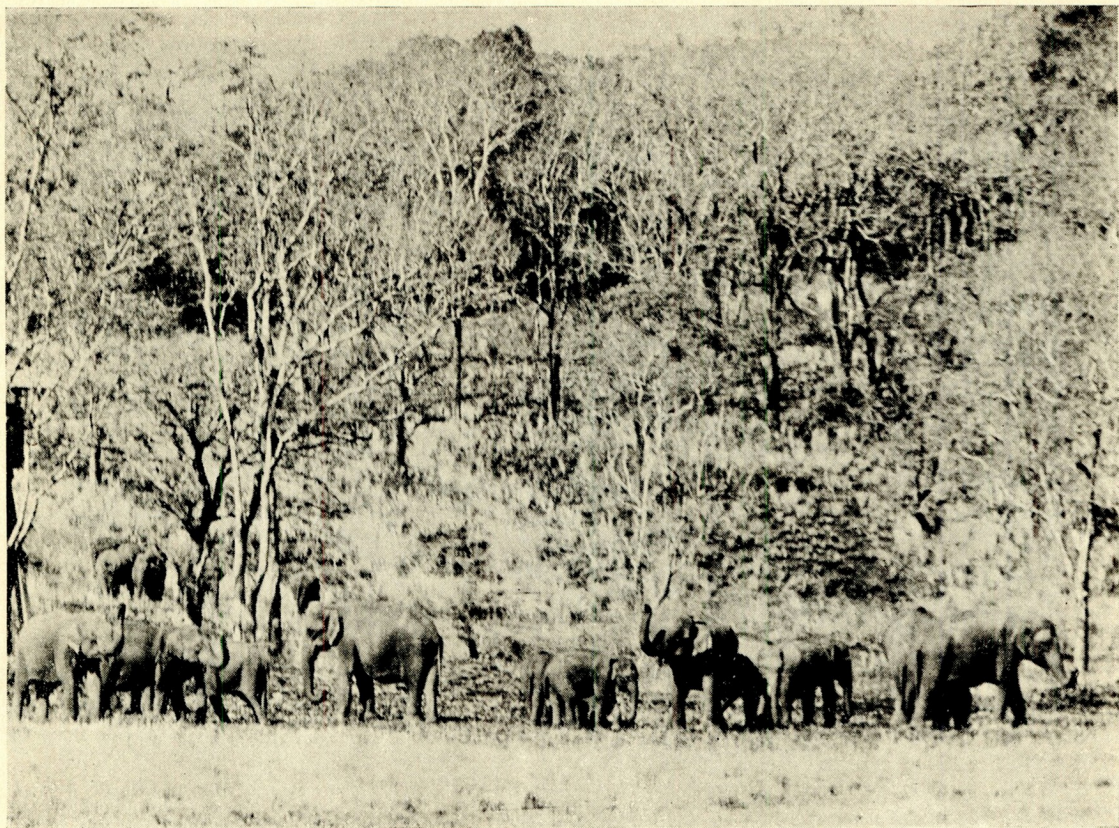
The picture that emerges after the present ecological survey is that of a Sanctuary with tremendous natural advantages and high potential, but one that has been allowed to languish due to lack of scientific management. As regards natural advantages, the position of this Sanctuary is enviable. The relatively high primary productivity should have resulted in a plentiful crop of second and third level consumers, in the form of a diversified herbivore



Decaying tree stumps are a hazard to navigation and they mar the scenic beauty.



Plantation habitat, on way to Sabarimala. Cleared forest where thick growth of elephant grass is now the only undergrowth.



A part of a large herd near Edappalayam.



Wood Pigeon



Wood pigeon

(Refer Page No 38)

—Photos by Osman.

and carnivore fauna. Two major rivers and a large labrynthine lake, are available to sustain this living crop of wild life. The forest, in greater part, is undisturbed and primary, without any forest exploitation. Human settlements are absent for the major part, there being only 3 settlements with a total population of approximately 800 people. Grazing by domestic stock, is negligible on the whole, although in the Thekkadi area it is gradually increasing. Poaching also is not much of a problem here (18 cases from 1963-1968). If, inspite of all these favourable factors, the Sanctuary is not only unable to sustain a bountiful crop of wild life, but is also fast losing its ecological balance, this is due to the inadequate attention paid to the only limiting factor, which is biological. In short, the ecological balance is upset here mainly due to the density-increase of the predator independent species together with the crash of population of the predation-subject species.

Improved land use pattern

Another factor revealed in the survey is the need for improving the land use pattern in the Sanctuary by augmenting the species diversity of the herbivores. At present the land resources of the Sanctuary are in a state of under-utilization due to the poverty of diversified herbivore and the declining population of those that are extinct. This aspect has been little realized in our wild life efforts. According to one estimate, cattle require 4 to 5 acres of land a head to be in fair condition but game species require less than 30% of the ground required for cattle. Thus, given enough watering facilities, it may be true that our forests can hold many more faunal species than they contain now, especially through a judicious programme of multiple land use. While this ensures a higher and more diversified species yield, it is basically essential for the conservation of the ecosystem. And conserving the ecosystem is the best means of conserving the species. Multiple land use here means the optimum use of the land by as many diverse herbivore species as is necessary to utilize the primary productivity of the land at an optimum level. Such an optimum utilization is required to keep the ecosystem in prolific condition. A grassland unused or underutilized, soon becomes overgrown by plant species unpalatable to a majority of herbivores. Results of many experiments in this connection show that grazed pasture contained more wild species, both big and small, than ungrazed pastures and that the most favoured grassland is one which is grazed by a diversity of herbivores. At present the primary productivity of the Periyar Sanctuary is largely underutilized as both the diversity of species and their population are very limited.

It is therefore desirable that a well thought out plan for reintroducing the spotted deer should be undertaken as soon as the population of wild dogs is brought down to a healthy level. It may also be worthwhile to attempt the introduction of the Swamp deer, (*Cervus duvauceli branderi* (Pocock) at least as an experimental measure. In this connection, stocking of Blacknaped hare, (*Lepus nigricollis nigricollis* Cuvier) after artificially breeding them in sufficient numbers, would be helpful in two ways. While they are grazers, themselves utilizing the grassland, they would also serve as a "buffer species" to give a certain amount of

diversion to the predators, thus relieving the pressure on other herbivores at least to some extent. This species is, of course, now present in the sanctuary, but in small numbers only.

RECOMMENDATIONS

The following are some of the measures urgently called for

1. Immediate action should be taken to control the wild dog population in the Sanctuary. This can be done by direct decimation as well as by the indirect pressure relieving techniques. A scheme can be drawn up after consultation with specialists.
2. A general wildlife census, so far not done in the Sanctuary, should be conducted, to serve as the basis for planning further activities.
3. A scientific ecological study of the wild elephant population should be done by a competent specialist, with special reference to the carrying capacity of the Sanctuary.
4. Toward better realization of multiple land-use, reintroduction of spotted deer, *Axis axis axis* (Erxleben) should be undertaken on a large scale, after the wild dog population is reduced to a healthy level. The introduction of new species like Swamp deer (*Cervus duvauceli branderi* (Pocock), may also be experimented upon. Stocking with Black-naped hare (*Lepus nigricollis*) after initial farming, should also be tried which would serve a two-fold purpose viz. increased land use and provision for a buffer species to divert predation.
5. Small scale dykes and damlets may be constructed across some of the major diverticulac of the lake to ensure a constant water level to induce aquatic plant growth so that more water birds may be attracted to the Sanctuary.
6. As far as possible, only those with a genuine interest in Wildlife should be posted here as officials. They should be imparted at least some basic training in wild life management.
7. It is understood that an area of 4922 acres in the Sanctuary, has already been planted with *Eucalyptus grandis*, which is really unfortunate. Such planting should be discontinued or at least not allowed to expand. Besides introducing exotic species, it tends to convert the habitat into a monotypical one which is detrimental to the thriving of diversified fauna.
8. By way of added tourist facilities, more accommodation at Thekkadi on more moderate charges, provision of diverse recreational facilities like more picnic spots, well laid parks (only of Botanical garden type) open air theatre, licensed angling on a restricted scale etc., should be provided. The lake should be cleared of the tree stumps that mar the scenic beauty of the lake. Also a number of trekking tracks should be prepared leading to the four forest bungalows in the interior. An adequate area in front of these bungalows should be cleared, succulent grass grown, and salt licks provided to attract herbivore species. Trained elephants could also be provided.

Acknowledgement

I am thankful to the Director, Zoological Survey of India for making this survey possible and to the Wildlife Preservation Officer, Thekkadi for all help rendered.

Table 1

Herd locality	Composition				
	Adult male	Adult female	Juvenile	Infants	Total
A. Near Edappalayam	3	18	14	2	37
B. Ca. 8 Km. from above toward dam	2	12	9	—	23
C. Ca. 6 Km. from Manakkavala	3	15	11	—	29
D. Near Manakkavala rest house	3	16	13	—	32
E. Ca. 5 Km. north from boat landing	—	9	5	1	15
F. Ca. 3 Km. from "4th ml" on way to Saharimala	2	14	10	1	27
	13	84	62	4	163

Table 2

Ecological Range of Principle Species of Wildlife in Periyar Sanctuary, Kerala State

Species	Grassy peripheral belt of lake	Interior tall grassland	Cleared forest and plantations	High grassy slopes and summits	Interior dense forest	Marshes and Swamps
1	2	3	4	5	6	7
Elephant (<i>Elephas maximus</i>)	—	—	—		—	x
Gaur (<i>Bos gaurus</i>)	—	—	x		—	x
Sambhar (<i>Cervus unicolor</i>)			x	—	—	x

(Contd.)

Table 2—(Contd.)

1	2	3	4	5	6	7
arking deer (<i>Muntiacus muntjak</i>)		x		x	-----	x
Mouse deer (<i>Tragulus meminna</i>)		x	x	x	-----	x
Tiger (<i>Panthera tigris</i>)		---	x	-----	-----	x
Sloth Bear (<i>Melursus ursinus</i>)	x			---	-----	x
Boar (<i>Sus scrofa</i>)		-----	x	x	---	-----
Wild dog (<i>Cuon alpinus</i>)	---		x	---	-----	---

----- favoured, — less favoured, occasional, x usualy absent

Table 3

Present Status of Some of the Better-known Species of Wildlife in Periyar Sanctuary

Species	Main habitats	Movements	Status
1	2	3	4
Indian Elephant (<i>Elephas maximus</i> <i>Indicus</i> G. Cuvier)	Grassy area around lake, sholas with bamboo growth, disturbed forest with grassy undergrowth.	Annual shuttling from interior to around lake and along Pamba river in summer and back to interior in rainy season.	Density acute but population a declining one.
Gaur (<i>Bos gaurus gaurus</i> H. Smith)	Grassy area around lake, high slopes and summits.	More or less like above.	Declining population.

(Contd.)

Table 3—(Contd.)

1	2	3	4
Sambar (<i>Cervus unicolor niger</i> Blainville)	As above.	No seasonal movement Restricted local range.	Much depleted; survival threatend.
Barking deer (<i>Muntiacus muntjak aureus</i>) (H. Smith)	Thick interior, around lake and clearings.	Restricted local range under fixed territory.	Common
Mouse deer (<i>Tragulus meminna</i>) (Erxleben)	Interior with thick undergrowth.	Restricted local range.	Occasional
Wild boar (<i>Sus scrofa cristatus</i> Wagner)	Interior grass forest, marshes and swamps around lake.	Restricted local range.	Common, tending to be less so.
Sloth bear (<i>Melursus ursinus ursinus</i> Shaw)	Open forest in rocky terrain	Wide local range.	Occasional
Nilgiri langur (<i>Presbytis johni</i> Fischer)	Around lake; evergreen shola forests near water courses.	Inside of 2 sq. km. under fixed territory.	Common
Lion tailed Macaque (<i>Macaca silenus</i> Linn.)	Interior high shola forests and mountain tops.	As above.	Only a few troupes.
Bonnet Macaque (<i>Macaca radiata diluta</i> Pocock)	Deciduous disturbed forest.	As above.	Occasional
Tiger (<i>Panthera tigris tigris</i> Linn.)	Interior riverine forest, and hill slopes.	Wide cyclical coverage.	Scarce (probably under ten in number)
Panther (<i>Panthera pardus fusca</i>) (Meyer)	Interior riverine forest also open disturbed forest.	Wide local range	Scarce
Fishing cat (<i>Felis viverrina</i> Bennet)	Thick interior, riverine forest also marshes.	Restricted local range	Rare

(Contd.)

Table 3 - (Contd)

1	2	3	4
Jungle cat (<i>Felis chaus kelaarti</i> Pocock)	Open forest and rocky terrain.	Restricted local range.	Rare
Wild dog (<i>Cuon alpinus dukhunensis</i> Sykes)	Interior forest.	Wide ranging and usually on the move.	Abundant
Jackal (<i>Canis aureus naria</i> Wronghton)	Wide spread, living in diverse habitats.	Wide ranging.	Common
Little civet (<i>Viverricula indica indica</i> (Desmarest)	Grass and undergrowth of open forest.	Restricted local range.	Occasional
Palm civet (<i>Paradoxurus hermaphroditus hermaphroditus</i> (Pallas)	Open forest and out skirts.	Restricted local range.	Occasional
Grey mongoose (<i>Herpestes edwardsi edwardsi</i> (Geoffroy)	Patches of riverine forest near open clearings.	Restricted local range under fixed territory.	Occasional
Smooth-coated otter (<i>Lutra perspicillata perspicillata</i> Geoffr.)	Lake, rivers, and creeks	Restricted generally, wandering during floods.	Occasional
Giant squirrel (<i>Ratufa indica maxima</i> Schreber)	Interior forest around clearings.	Very localized and circumscribed.	Common
Dusky-striped squirrel (<i>Funambulus sublineatus sublineatus</i> Water house)	Open woodlands as also thick riverine forest.	Localized.	Common
Blacknaped hare (<i>Lepus nigricollis nigricollis</i> Cuvier)	Thick undergrowth in open forest.	Localized and circumscribed.	Occasional
Crested porcupine (<i>Hystrix indica indica</i> Kerr)	Hill sides with bamboo clusters.	Restricted local range.	Occasional

With the Tiger-Tracer

By

S.R. CHOUDHURY I.F.S.

Senior Research Officer, Wild Life Education Course

October to December, 1970; three months gap between the first Wild Life Education Course and the current one. "Let us try out your Tiger-tracer in the field", I told Nihar and she readily agreed. We did work in the Delhi Zoological Park, November 12 to 22; Khara and Chilla Shooting Blocks in the Lansdowne Forest Division in U.P., December 2 to 17, and Nandankanan Biological Park (Orissa), December 28. We covered the Khara and Chilla forests again during January 27 to February 11, 1971, and this time we had with us 11 Officer trainees of the second Wild Life Education Course. Each had his Tiger-tracer. Much useful work of replication was done by most of the trainees.

The results are as here-under in brief, in the context of my previous articles... .. "Let us count our tigers" and "The Tiger-tracer" in volumes 12/2, May 70 and 13/1 October 70—appearing in this journal.

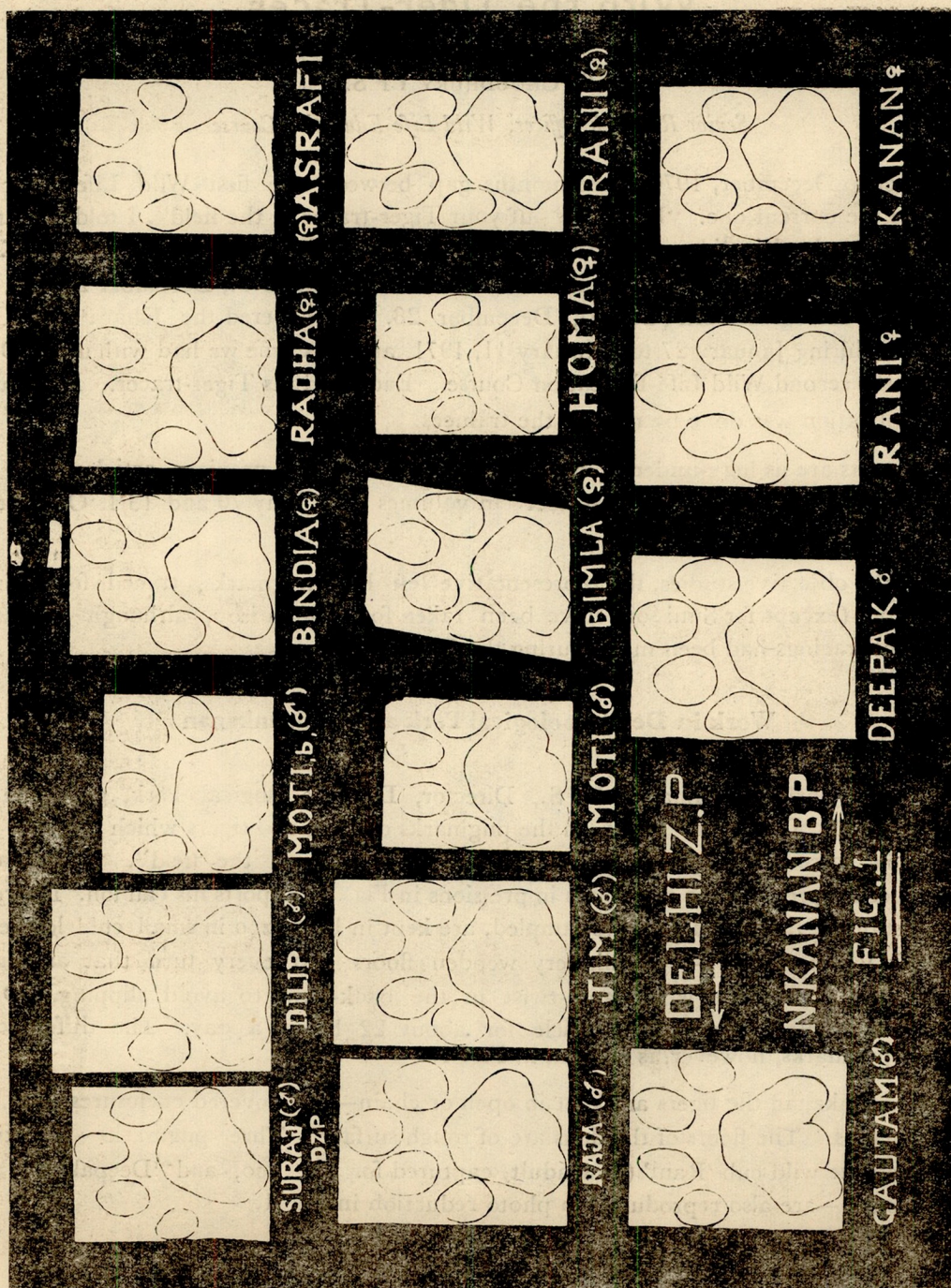
In all the objective studies, the representative left hind pugmarks, traced from similar soil conditions (except for Suni sot), have been taken for comparison, although more than 150 different tracings had been made during the field works.

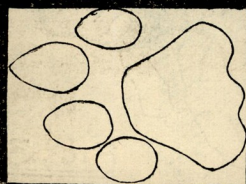
Work in Delhi Zoological Park and Nandankanan

Biological Park (Orissa)

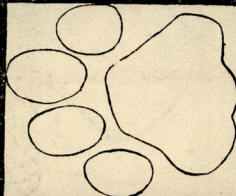
My friend Shri C.L. Bhatia, I F.S., Director, Delhi Zoological Park, gave the first cautioning word, "Do not rely much on the pugmarks of these zoo tigers which are kept here, as you know, in conditions very different from what you find in the field". A look at the photo-reduced representative pugmarks impressions in Fig. 1, supports his caution. The reason is that most of the tigers and tigresses sampled, are kept in Delhi zoo in small cubicles—enclosures III & VI particularly—with slippery wooden floors. At every turn that an animal takes on such a floor, there is an auto-twist in the back-paws to avoid slipping. On an average each animal stays in its cubicle for about 22 hours a day. The difference in individual pugmarks, however, is evident in Fig. 1.

In Nandankanan the tigers are kept in open or chain—link covered enclosures with large natural grounds. The floors of the dens are of rough surface. Three pugmarks—wild tigress 'Kanan' and the wild cub 'Rani' (now adult) captured for the zoo, and 'Deepak' the male born in the zoo—are also reproduced in photo reduction in Fig. 1.

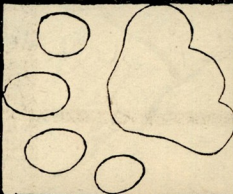




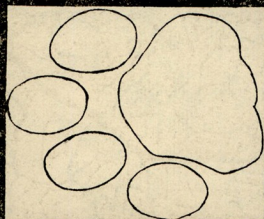
KUNAU ♀
15.12.70



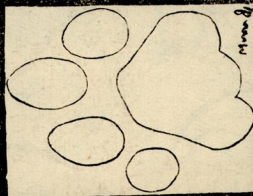
DOGADDA ♂
7.12.70 & 9.2.70



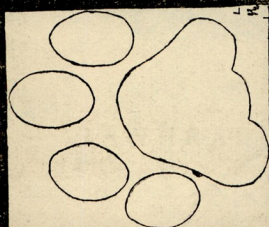
SUNISOT ?
7.12.70



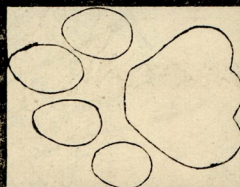
MUNDHAL
PAIR
3, 10 & 14.12.70
2 & 7.2.71



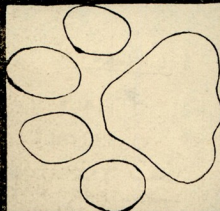
KHARA AND CHILLA
SHOOTING BLOCK



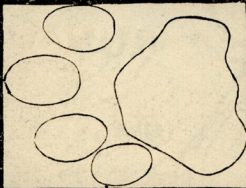
LUNI
PAIR
11.12.70
30.1.70



GOLAWALI ♀
12.12.70, 27.1.71



DHALWALI ♂
9.12.70



CHASIRAM ♀
5.12.70, 6.2.71

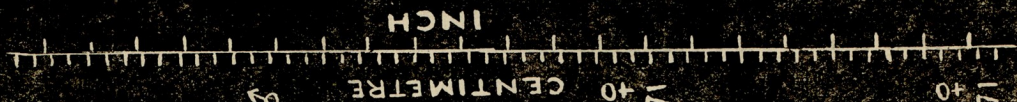


FIG. 2

KHARA & CHILLA

SHOOTING BLOCKS

SCALE 1" = 1 mile

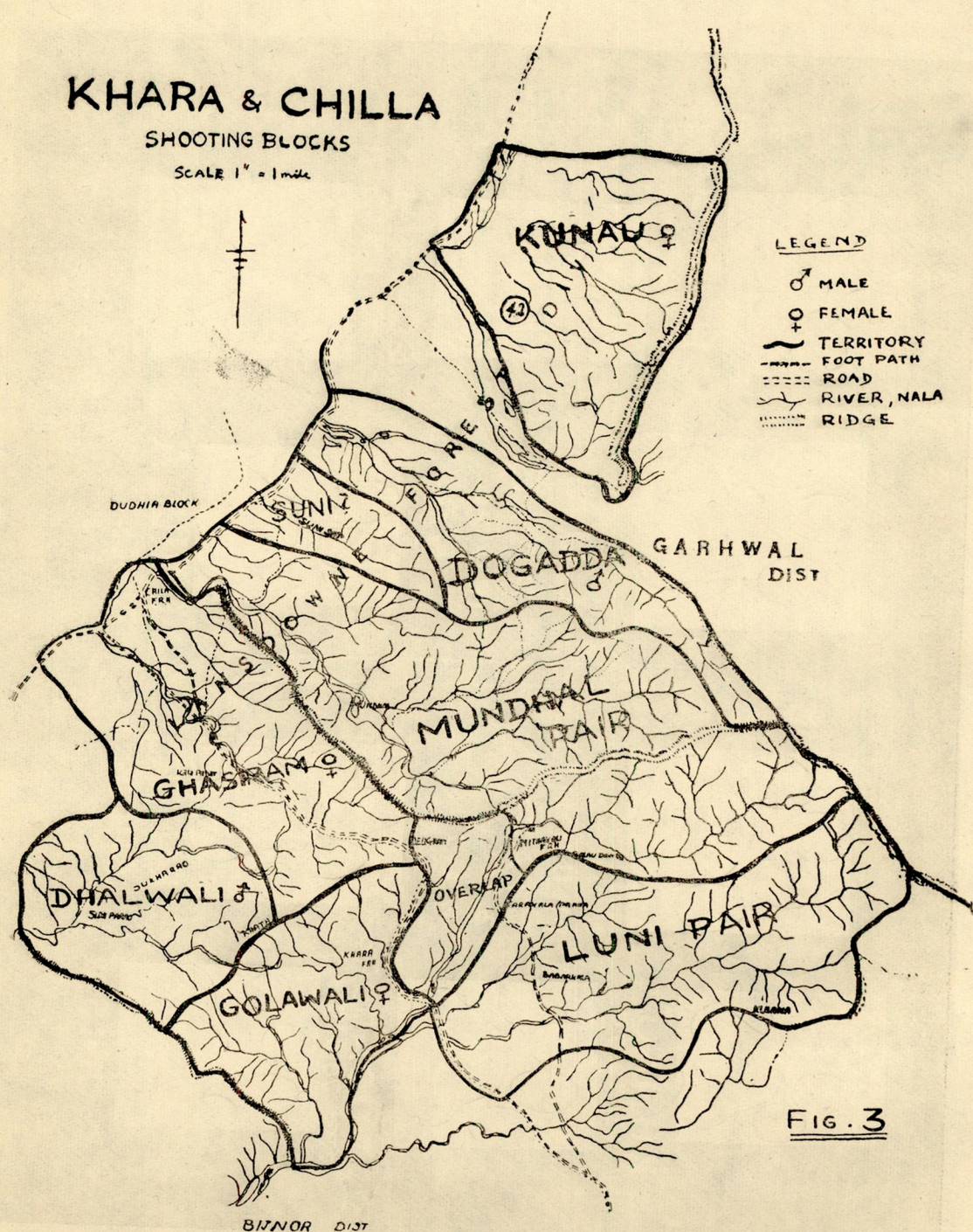


FIG. 3

An in-depth comparison of the pugmarks of the tigers (♂ & ♀) indicates, the difference in living space and the floor conditions that may reflect in the shape of the pugmarks. The comparison may also raise a question that with some of the pugmarks, which look alike, it may not be easy to pinpoint individuals in adjacent territories in the field. A look at Fig. 2 will dispel much of this doubt. When the Tiger-tracer is used correctly it brings out the distinctiveness of each separately, not only to pinpoint the individual animal, but to a large extent its sex also. Of the three impressions from Nandankanan, under more natural conditions, that of Deepak (male) is big and squarish and those of Rani and Kanan are smaller and triangular (more 'lady like' as a forest guard aptly put it). Deepak and Rani are of same age, a little over three years.

Work in Khara and Chilla Shooting Blocks

In December, 70, the Tiger-tracer with us had detected ten different tigers (♂ & ♀). The work with my students showed, in exact replications, after over 2 months, the tiger of Dogadda, the pairs of Mundhal and Luni, the tigress of Golawali sot and the tigress of Ghasiram sot. They were continuing in their respective jurisdictions, singly or in pairs, similar to what had been found in the December work. A map showing the projection of respective territories from the applied Tiger-tracers is given in Fig. 3 and the representative left hind pugmark (photo-reduced) of each is in Fig. 2. The remaining three could not be relected for want of time.

Observations

- (1) Maintenance of individual territories is evident from the replication of the tracings in respective jurisdictions in the case of 7 animals, after a gap of over two months.
- (2) This behavioural pattern can be used in the Tiger-tracer not only to confirm the estimates by replications, but to a large extent also to determine the territorial limits of each.
- (3) The animal can be identified with enough accuracy by the Tiger-tracer.
- (4) Persistence with the Tiger-tracer would result in clearer ideas of the important behaviour and movement patterns of each.
- (5) Pairing, duration and joint territories can be recognised and watched.
- (6) Cubs can be anticipated.
- (7) In our field work, local enquiries at Kunau, Dogadda and Mundhal (Amgadi) had drawn blanks; often an emphatic "No tigers in the area now". But with the methodical search in which both Nihar and my students were of immense help, we found the pugmarks of tigress (K), tiger (D) and pair (M).

- (8) The most significant utility of the Tiger-tracer, however, was in clarifying the confusing signs and symptoms in the field. One such, the trickiest of all, happened with the Mundhal pair on February 2, 1971. Three lines of tiger pugmarks were found on the sand, crossing the 'Amgadi Rao' from right to left. Two of these lines with smaller pugmarks, were 70 to 80 metres apart. The third line was 300 metres down stream; much larger pugmarks, undoubtedly of the tiger. Search, up and down the sot, did not show any line of return, left to right. Even Jai Singh, Wild Life Warden of 15 years experience said (understandably) that it could be a tiger, a tigress and a grown up female cub. Two tracings of two hind right pugmarks were taken on two Tiger-tracers, from the line in the middle. Each was superimposed in turn over one of the right hind pugmark in the first line, upstream. The markings were so complete that there was no doubt left about the identity of the only tigress which had left two sets in two lines in the same direction. Further probe revealed her separate movement—after leaving the impression along the first line—in a wide upstream loop over hard and bouldery terrain and back again in the direction of the tiger, to leave the second confusing line of pugmarks. The confusion was thus settled with conviction, by the Tiger-tracer.
- (9) Speed with the Tiger-tracer is evident from the time spent in the field and the adequate replicated results in Fig. 2.

Caution

- (1) Faulty selection of material for the Tiger-tracer may lead to more confusion than confirmation. In my early wildlifing days as a school boy, tracing of tiger pugmarks with oiled paper—rubbing thin white paper flat on the head—used to produce crude tracings. Later improvements with tracing cloth, held tight and flat in a darning-ring produced slightly better results. But these could not be fool-proof field equipment. I have been told that a celluloid plate with area-square lines etched-in, provides a ready tracer-cum-area computer. This of course is only a white collared conjecture, not hard practice. The field proves it. The square lines engraved plus the other scratches that a celluloid plate will acquire during field use, have to be put on a pugmark in the forest to realise how crude such an implement would be.

A not too thick glass plate—easy for cleaning and not easy to take scratches—with adjustable stands, is the cheapest and best. It carries no confusing lines and once put firm on the pugmark, stays put throughout the tracing work. This is very important when subtle lines of unidentically superimposed front with back pugmarks have to be carefully studied to make out the exact periphery of the back pad and trace it correctly. Even the slightest movement of the plate, while tracing, will produce an inaccurate copy which may confuse the estimate. Hence the need for the adjustable stands.

- (2) Inadequate practice in using the Tiger-tracer may defeat its purpose with unreliable tracings. This I have seen with my students, to realise what an amount of repeated practice under proper guidance is necessary for many to get confidence and reliability.
- (3) Tiger-tracer is a refinement of the "Co-operation-tiger-census" (Choud hury method) for population estimates. Its efficiency is enhanced by correct judgement of the representative pugmarks in the field and many replications, not only to know how many, but more exactly, where and when. In combination, the average stride length may further confirm recognition.
- (4) Put reliance on the fresh impressions but take note of the old ones too, know the comparabilities and never be hasty.

Heard during my work (Translated from Hindi)

- (1) In the city, "If you want to get a prize take the impressions on pre-setting soft cement, or make the tiger walk first in water and then on a dry cement floor to get the exact impressions".
- (2) In the forest: "Such is the difference in the spread of pugmarks in different ground conditions that it beats my (Forest Guard) comprehension as to how the different sets of three bamboo splints will make it possible to estimate the number. And how am I to get the measure of the front paw ?

NEEDS THINKING—RATIONALLY AND PRAGMATICALLY to avoid waste of public money.

Winter Track Census Survey of Wild Life of Palamau National Park

By

J. MISHRA, I.F.S.

Divisional Forest Officer, Daltonganj South Division

Last year the first track census survey was conducted on the 4th January, 1970. As the summer track census survey is conducted on the 7th of May each year, to keep uniformity in dates, it was decided to conduct the winter track census survey on the 7th of January, 1971, instead of the 4th.

This was the second winter track census survey, conducted in the Palamau National Park. Advantage was taken of last year's experience. This time, two Assistant Conservators of Forests, who had undergone a wild life training course at Dehra Dun and had experience as game wardens of national parks, volunteered their services as leaders of two tracks. This greatly enhanced the authenticity of the count and also infused greater courage in the staff employed in the operation.

Preparation of the Tracks

Palamau National Park, covering 100 sq. miles, consists of five census blocks. In each block we had last year's parallel census strips laid out at every 400 to 500 yards with the help of a Prismatic Compass. These track lines are almost equidistant parallel lines running in every census block. The track lines numbered 147 as follows:—

Name of Census Block		Total No of Tracks
1. Betla	...	30
2. Chhipadohar	...	40
3. Harnamar	...	23
4. Mundu	...	28
5. Haratu	...	36
Total		<u>147</u>

Conditions at the Time of Survey

The 7th January '71 was a sunny day with light-whitish clouds lurking on the horizon. There was little wind. The work of the coupe purchasers in the entire National Park was stopped from the 5th January '71. The conditions were therefore almost identical to that of the previous year.

Constitution of Census Parties:—

147 census parties were formed, each consisting of a leader and a follower. Two of the census parties were headed by two Assistant Conservators of Forests. Endeavours were made

to put in only forest staff as the leader of each census party, but the number of the available staff was the limiting factor. The constitution of the census parties was as follows:—

Sl. No.	Name of Census Block	No. of Parties	Track Leaders
1	Betla	30	20 staff, 10 outsiders
2	Chhipadohar	40	22 „ 18 „
3	Harnamar	23	9 „ 14 „
4	Mundu	28	27 „ 1 „
5	Haratu	26	26 „ — —

Thus, out of the 147 tracks, 104 tracks were headed by forest staff, while for the remaining 43 tracks, literate village headmen worked as the leader of each party. Three extra parties were kept ready as 'Reserve', in each census block, but it is gratifying to note that no contingency arose to use them. All the 147 track census parties had to observe the following instructions:—

- (i) Each census party consisted of two men, a leader and a follower.
- (ii) Each party was supplied with a printed form to record the animals on the spot.
- (iii) The parties reached their starting point by 6.45 A.M.
- (iv) The parties started moving noiselessly along the track lines, at exactly 7 A.M.
- (v) Entry had to be made whether animals were seen in isolation or in groups and the category into which they fell, i.e., male, female, yearlings, and fawns.
- (vi) Only fresh pug marks of tiger were to be taken note of and their dimensions recorded.

It is to be noted that before the actual day of census the following steps had been taken:—

- (a) All the departmental works and all operations in the forests throughout the National Park were stopped from the 5th to 7th January '71.
- (b) No domestic cattle were to be allowed to enter the forests before 11 o'clock in the morning of the 7th January.
- (c) Visitors to the Park were not allowed to move in it during the morning hours from the 5th to 7th January '71.

Expenditure Incurred

The expenditure incurred in clearing the track lines and in employing track leaders and followers, was:—

1. Clearance of 147 track lines	...	Rs. 1105/-
2. Payment of wages	...	Rs. 310/-
Total		Rs. <u>1415/-</u>

(Rupees one thousand four hundred fifteen only.)

Track Census Work

The track census survey started at exactly 7 A.M. on the 7th January 1971, and as per schedule ended at 10 A.M. By the evening of the same day, the entire census papers of 147 tracks were in hand.

Processing of the Count

Each individual track census paper was thoroughly examined and checked. To avoid duplication, every consecutive track was compared in minute detail. Some interesting examples of duplication are furnished below:—

In Haratu Census Block Track No. 1, one sambhar stag ran from left to right on a hillock at 8.15 A.M. Track No. 2 also saw a Sambhar stag on the same hillock at 8.35 A.M. This obviously was the same and hence was expunged.

Track No. 9 spotted 8 wild boars running to its right. Track No. 10 also spotted 8 wild boars running from left to right. This appeared to be the same sounder of pigs spotted by both the parties. Hence one count was expunged.

Track No. 19 saw 7 wild boars running through a stream from left to right. Track No. 20 saw 12 wild boars running from left to right at the foot of the hills. Obviously it was the same sounder of pigs and as such the first count was expunged.

In Mundu Census Block, Track No. 10 saw 2 sambhar hinds running from left to right. Track No. 11 also saw one sambhar hind and one yearling running on a hillock. Probably the yearling was taken as a hind by the former party and hence it seems probable that the track man mistook the same as 2 hinds and as such one was expunged.

Again on Track Nos. 22 and 23, the party on the former saw a pair of spotted deer and the party on the latter also saw a pair of them. This probably was the same pair and hence to avoid duplications, one was expunged.

In Betla Census Block, Track No. 18 saw 3 spotted deer (one male, one female and one fawn). Track No. 19 also saw three spotted deer (one male, two females). To me it appeared to be the same herd, for a yearling might have been counted as a hind by the latter party. Hence one was expunged.

In Harnamar Census Block, the party on track No. 15 spotted three sambhars (one stag and two hinds) on a hillock running to its right. Track No. 16 also saw two sambhars (one stag and one hind) getting down at the foot of the hill. To avoid duplication, the second count was expunged.

An examination of the count on Track Nos. 17 and 18 presents a very interesting study. Between both the tracks there was a hillock on which the first party spotted two sambhars and the second three. The first should, therefore, be taken as a duplication and was expunged.

Examination of Track No. 19 and 20 presents a similar type of duplication as the above. The parties on both the tracks spotted a sambhar stag on a hillock. Hence one has to be expunged.

In Chhipadhar Census Block, the party on Track No. 18 saw a sambhar stag running to the right. Track No. 19 spotted a sambhar stag coming from the left and crossing to the right. This was obviously the same stag and hence one was expunged.

Thus after a thorough scrutiny, the figures of all the tracks were added up to give the tracks census count of the National Park, which was as follows:—

<i>Name of animals</i>		<i>1971 winter Tracks Census Count</i>
Tiger	...	14
Leopard	...	4
Hyena	...	3
Wolf	...	1
Wild dog	...	9
Elephant	...	6
Bison	...	81
Sambhar	...	148
Blue Bull	...	14
Cheetal (spotted deer)	...	625
Barking deer	...	95
Wild Boar	...	333
Bear	...	7
Peacock	...	218

This being the second winter Track Census Survey, it is worthwhile comparing the two winter census statistics. The figures are:—

Sl. No.	Name of animals	1970 Winter Track Census count	1971 Winter Track Census count	Percentage Increase or Decrease
1	Tiger	12	14	17% increase
2	Leopard	1	4	300% „
3	Hyena	2	3	50% „
4	Wolf	12	1	Serious decrease in number
5	Wild dog	—	9	—
6	Elephant	nil	6	They are on the other side of the Koel river in 1970
7	Bison	61	81	33% increase
8	Sambhar	139	148	7% „
9	Blue Bull	7	14	100% „
10	Cheetal	597	625	5% „
11	Barking deer	62	95	50% „
12	Wild boar	263	333	25% „
13	Bear	2	7	250% „
14	Peacock	123	218	75% „
15	Porcupine	—	5	—

It would thus be seen that in almost all cases there had been a steady increase in the number of all species except in the case of the wolf. Special studies will have to be undertaken to determine the cause of the dwindling number of wolves. It may be only a matter of chance that they were not spotted on the tracks. But this is being investigated. In the coming summer census this will also be kept in view.

In last year's count no elephant was seen, as all of the elephants had moved down to the other side of the river Koel (into Chainpur Range). This year 6 of them were in the Park.

Tiger Census Count

It would be of interest to examine separately the track census figures of the tigers. In the 147 tracks, tigers were either seen or their fresh pug marks identified in only 19. In 7 different tracks, however, tigers were clearly seen by the trackers.

Let us now examine in detail each census block separately so as to ascertain the minimum number of tigers spotted in each census block.

Census Block	Seen	Fresh Pug Mark	Remarks
Betla	Track No. 25	Track No. 6 - 5" × 4"	
	„ 29	„ 13 - 4" × 4"	

In Betla Census Block, the two tigers which were seen on Track Nos. 25 and 29 have to be accepted. The pug marks on Track Nos. 6 and 13 being almost identical, it is presumed they that were the pug marks of the same tigress. Hence in Betla Census Block the presence of two tigers and one tigress has to be admitted.

Census Block	Seen	Fresh Pug Marks	Remarks
Chhipadohar	Track No. 21	Track No. 19 - 6" × 6"	
	„ 25	„ 23 - 7½" × 5"	
	„ 29	„ 24 - 5" × 4"	
		„ 26 - 6" × 5"	
		„ 31 - 5" × 4"	

In 3 tracks, i.e., in Track Nos. 21, 25 and 29, two tigers and one tigress were actually spotted by the trackers. Therefore these have to be accepted. Fresh pug marks were seen on Track No. 19. Hence these have also to be admitted. On the remaining 4 tracks, i.e., Track Nos. 23, 24, 26 and 31, fresh pug marks of tigresses were noticed. As these are all adjacent tracks, the pug marks were probably of the same tigress. Hence only one pug mark is admitted. In all three tigers and two tigresses (3 seen and 2 admitted by pug marks) were surely present in the Census Blocks.

Census Block	Seen	Fresh Pug Marks	Remarks
Harnamar	Nil	Track No. 1 - 4½" × 4"	
		„ 2 - 5½" × 4"	
		„ 20 - 7" × 6"	
		„ 20 - 6" × 4"	

In this Census Block no tiger was seen by any tracker. On Track Nos. 1 and 2, fresh pug marks of a tigress were seen. Both the pug marks seem to be of one and the same tigress. Hence only one pug mark is admitted. On Track No. 20, near "Sijuahi" (which is a water hole) there were two fresh pug marks of different sizes. These were the pug marks of a tiger and a tigress. Hence both have to be admitted. Thus the presence of one tiger and two tigresses in this census block is supported by the pug marks.

Census Block	Seen	Fresh Pug Marks	Remarks
Mundu	Track no. 23	Track No. 8 - 4"×4"	
	„ 28	„ 14 - 4"×4"	

Two tigers were seen on Track Nos. 23 and 28. These have to be admitted. On Track No. 8 a fresh kill of a spotted deer was discovered and the pug marks indicated the presence of a tigress. Hence this should be admitted too on Track No. 14, where a fresh pug mark of 4"×4" was noticed. It is presumed that this is almost identical to that of Track No. 8. Hence this one needs to be expunged. Therefore, in this Block the presence of two tigers and one tigress has to be admitted.

In Haratu Census Block, neither any tiger was seen nor any fresh pug marks noticed. Hence there appears to be no tigers in this Census Block at present.

It is therefore evident that at a total of eight tigers and six tigress (7 seen and 7 admitted on the strength of fresh pug marks) were in the entire National Park on the day of the census.

Speech delivered by Lt. Col. Fatesinghrao Gaekwad of Baroda, Minister for Health, Fisheries & Jails, Government of Gujarat at the Twelfth Annual General Meeting

Fellow Conservationists,

You will realise how happy I am to be amongst you this afternoon when you appreciate that I have come all the way from Barodaa—about 1400 kilometers—just to meet and address you ! A few months ago, when your President kindly invited me, I spontaneously agreed. The reason— you belong to a rare sub-species of the animal world which I like most and to which I also belong—Conservationists ! I am fully conscious of the honour you have done me.

As is my practice, my intention was to speak to you *extempore*, but over the last few days I realised that if I did so, I would not know where to begin and where to end, for such is the scope of the subject of our love. I, therefore, decided to sit down and dictate this address, in which I have tried to focus attention on some aspects which require particular emphasis. If I bore you, I trust I will be forgiven.

Fellow Conservationists, we belong to a country whose treasure of flora and fauna are second to none on the face of this Earth, and whose great natural resources, too, have scarcely been tapped. And yet, over the last century, in general, and in the last two decades in particular, there has been wanton exploitation of natural resources and a far more wanton destruction of our flora and fauna. I suppose we can be condoned for our actions in the pre-Independence era by arguing that we were then not the masters of our Destiny, but have we any excuse for the destruction that has been wrought over the last 23 years ? Progress—agricultural, industrial, scientific—for an under-developed nation like ours, is the only road towards prosperity. But surely, progress does not mean going ahead using unscientific methods, ill-planned industrialisation and an agricultural policy which has not taken into account the forests and their denizens. This, in a nut-shell, is what we have 'achieved' over the last 23 years. Some species of both flora and fauna have been lost to us forever. May be, even during our own life-time, the Capital City of Delhi will be standing in the middle of a desert, every glass of water that we drink and every gulp of air that we take will be polluted, and coming closer, we will have succeeded in the total extinction of say, the Asiatic Lion, the Indian Rhinoceros, the Great Indian Bustard, even the tiger and many species of plant life. I may be accused of exaggeration, but I can assure you that my observations have been made after a deep study of the subject. While destroying nature and natural resources, the process

may appear gradual at the beginning, but only up to a point—the breaking point—after which the decline is so steep that it can no longer be arrested.

Can Legislation be the answer to India's conservation problems? Yes it can be, provided it is effective, and it can only be effective provided you have the right type of machinery, which briefly means adequate resources. However, furthermore, if the finding or diverting of resources was the only difficulty, this could be overcome. But in a country where the law-makers themselves have become the greatest law-breakers, and when legislation against floor-crossing is being seriously contemplated, what, may I ask you are the chances of legislation on conservation, succeeding? A total ban on the shooting and killing of the tiger has been mooted, and I think accepted. Excellent! A significant achievement! But, must not we destroy the man-eater and the cattle-lifter? Every other tiger will soon become either a man-eater or a cattle-lifter. The local authorities will declare, at the instance of an influential (monetary or political) 'gentleman' the presence of a man-eater in the locality and announce an award for its destruction. The 'brave' Shikari is conveniently near the locality, and after two days of toil in sand and sun, manages to shoot the man-eater, with a powerful rifle, at night, from a jeep with the aid of a powerful search-light! The 'hero' is publicly acclaimed and his simple request for the skin instead of the monetary reward is readily acceded to! I might add, that the late lamented tiger was one which a week ago had been badly wounded by a crop-protection gun, and had killed a cowherd who had accidentally crossed his path!

In India, a marathon battle is being fought to bring the population explosion under control. While it is imperative that the growth in population must rapidly decrease, it is equally peremptory that we speedily increase the population of conservationists. Let me be more specific. While Societies like yours are doing yeoman service to the cause, the purpose will no longer be served by weekly, monthly, or annual meetings. What is necessary now is field-work and a broader base of activity. Our first target must be the youth of this country, starting from school-going children. Simultaneously, conservationists must attack the rural areas and some of us must resign ourselves to the fate of continually climbing the steps of Central and State Secretariats. The only permanent answer is arousing mass public consciousness through proper education. Unless the message of conservation reaches the Common Man, we will be fighting a losing battle.

An important part of the answer to our problems is a five letter word—'MONEY'—. For, if any effective measures are to be taken, like the education of the masses, obviously resources have to be found. Where are these resources going to come from? They have to come from Government, from International Agencies, from private endowments and public subscription. It is true that the task that we have before us, will require unlimited monetary resources and a wide gap will always remain between the two. However, let this not act as a deterrent. We could be fighting against time, and we could be fighting for a hopeless cause, but as has been proved, if a will is there, even the impregnable Mount Everest can be conquered.

A question naturally arises as to who is the principal enemy of conservation? We do not have to go far to find the answer. It is an animal with a three-letter name—'Man'! Luckily, Man has never yet denied that he is an animal, that he is a being, a human-being. Nor has he ever contradicted the fact that he is an integral part of nature and that he is definitely not the earliest of creatures to inhabit the face of the Earth. Yet, curiously enough he has now assumed for himself a superior position and feels that he can, with impunity, do whatever he wishes with the rest of his fellow creatures. Having wrought tremendous destruction on his fellow beings he has now, ironically, partially, turned his attention to destroying himself! He foolishly thinks that while he can merrily go on destroying his fellow creatures, ultimately, he will be the lone survivor! Man will never be able to survive without Nature's other beings, but if Nature's other beings survive, Man's survival is assured.

In his book entitled, "The Year of the Gorilla", George Schaller has said:

"Man is conquering the diseases that once kept his population in check, and he is spreading his sway, exterminating other animals and exhausting the soil. With the same mentality that once enabled him to vanquish the lion and the bear, he is trying to subdue nature, sacrificing the eternal for the expedient. The destruction of the earth lies at his whim and cunning, yet he does not realise, does not feel, that he is not separate from but one with plants and animals, rock and water. He is as dependent on them as the protozoan, the tsetse, the gorilla. By setting himself apart from the ecological community, man has become a tyrant of the earth, but a tyrant who surely will fall if he succeeds in winning the struggle for existence".

Which brings me to the subject of how, Societies like yours and other individuals who feel almost indignant about the present state of affairs in this country, can effectively and constructively contribute towards a common cause.

The most constructive of all forms of protest is the development of the science of ecology, the study of the relations between men, animals and plants, and its practical aspect, conservation. Ecology shows how all the forms of life are linked together and that 'breaking the chain', or as the ecologist would put it, disturbing the balance of nature, brings incalculable consequences, which are damaging not only to man's moral nature but also to his material interests.

Although commonly used in Indian politics today, I am generally against the use of pressure tactics, but when it concerns the future of humanity, I think all tactics must be used. Properly constituted ecological bodies with wide powers must be set up both at the Centre and in each of the States. We must pursue this relentlessly.

For non-Indians who know our country, and for some of us too, India must surely present an enigma, especially when one takes into account the fact that the religion practised most is Hinduism. When almost all Hindu Gods and Goddesses have a direct connection

with wild life, how is it that the country is facing the problem of according protection to them? Lord Indra's mount is the elephant 'Airawat, Vishnu's mount is the eagle, the Goddess Saraswati's, the peacock; Goddess Durga's, the tiger and the Goddess of Wealth, Laxmi, has for her mount the owl. In the Ramayana, Lord Rama's most trusted lieutenants are the eagle (Jatayu), the monkey (Hanuman) and the bear (Jambuvan). But I suppose, one should understand the destiny of these dumb denizens of the forest, for look what fate has befallen even our Holy Cow!

And finally since both your Society and the Forest Research Institute function here in Dehra Dun, I feel it would not be out of order to draw the attention of both to a very unfortunate state of affairs which exists in this country. A totally unnecessary 'war' is being waged between the forester and the wild life preservationist. A widely spread misconception is that there is a clash of interests between the two. The argument is that the forester's sole objective is to bring in more revenue from the forests, completely ignoring its denizens, and it is said that the foresters reason "Why should the Nation lose so much revenue in protecting useless fauna?" Actually, there is a historical reason behind this misconception. Many years after the British left, the forester's curricula remained the same. Animal life was still plentiful and the need for protecting it had not been felt. I now reliably gather that a series of lectures on the preservation of wild life forms a necessary part of a forester's training. However, the easiest way out of this ludicrous state of affairs is the one I suggested at the recent meeting of the Indian Board for Wild Life, which is, to change the name of the Board to Indian Board for the Conservation of Nature and Natural Resources. This will help commit both to work together towards the same cherished goal.

One final word and I will have done. I realise that you are all keen conservationists, who feel very strongly, sometimes a bit too strongly about the prevailing state of affairs. For this reason I feel it necessary to sound a word of caution. Let your approach be rational, well-balanced and objective. Try and understand those who do not still understand you, those who are trigger-happy, and those who kill for the sake of killing and derive enjoyment from it. Do not become rabid preservationists. I will quote an example of what disservice can be done to the cause. Our Constitution says that Hindi shall be the National Language. Has it become so even after 23 years of Independence? Who have been its principal antagonists? Not those who come from non-Hindi speaking areas, but the rabid protagonists of Hindi. The fate that has befallen Hindi should not befall conservation in this country. After all, like me, most of you, I am sure, are converts. If somebody had come up to me, say 15 years ago, and told me that one day I would replace the rifle for a camera and become an avid conservationist, I would have simply laughed. Yet it did happen. Which brings me to say that my tribe the converts, I think make better conservationists than those who are opposed to killing on religious grounds.

We have seen and felt the absurdity in wanton killing. Ironically, one must witness the ugly, unnecessary "slaughter of the innocents" before we start to appreciate throbbing, pulsating, lovely life. And what is more, the realisation that some of what we are distroying can never be recreated has hit us converts hard. Is it not far, far better to record nature's beautiful creatures on celluloid than see them stiff and lifeless at our feet ?

What are we to do under these circumstances ? Remember what Lord Krishna told Arjun when Arjun was in a quandry—

हते वा प्राणस्यसि स्वर्गं, जित्वा वा भोक्ष्यसे महीम् ।
तस्मादु सिंह कौन्तेय युद्धाय कृतनिश्चयः ॥

It 's a challenge. Like men let us accept it.

Mr. President and Fellow Conservationists, I had warned you right at the beginning that my address would not be brief, and that it would be boring. I hope I have succeeded in doing both ! Thank you again, for hearing me patiently and for doing me this singular honour.

— — —

Ban on Trade in Certain Spotted Cats

Almost exactly a year after conversations began the International Fur Trade Federation announced on August 4th that they were prepared to impose the following:

1. A total ban on trade in: Giant Otter, La Plata Otter, Snow Leopard, Clouded Leopard and Tiger.
2. A temporary 3 year ban on cheetahs and leopards. They were also willing to mount a joint survey with SSC/IUCN on South American cats such as the Ocelot and Jaguar.

Himalayan Wood Pigeon

Columba palumbus casiotis

By

S.M. OSMAN

Comparatively few investigators have studied the pattern of behaviour and habits of the wood pigeons that roam widely over the entire Himalayan habitat. Some scattered accounts from hunters, and scanty information by ornithologists have helped to illuminate a few facts about the Indian species of the wood pigeon that yearly move many miles from their breeding grounds in the Himalayas to winter feeding quarters dispersed all over the foothills.

Though the birds travel widely and are commonly believed to be appearing in many parts of West Asia, North Africa and Europe, their measure and depth of range within and beyond the immediate Himalayan fastness, has not been properly ascertained so far. At the time of migration, it is supposed to occur along Sind and the North-West Frontier Province in West Pakistan, south, in the plains of Punjab, and east into Uttar Pradesh and parts of Bihar, preferring the lightly wooded areas for its transient sojourn.

A large stout, greyish brown pigeon, it measures some 43 centimetres and has a buff collar on the sides of its neck. When in flight, prominent white bars appear on the wings. Sides of its lower neck are usually of a glossy purple-green and red colour. Running across, under, and in the middle of the tail, there is a greyish-white band. Its lower back, rump, and tail are all of a dark sombre grey hue.

For over twenty years now, I have each winter and early spring, watched with interest the flow and ebb of flocks of these birds that visit the Doon valley. Their large size easily makes them recognizable causing identification to become quite easy. In droves of fifty or more they, throughout the short winter's day, keep gyrating back and forth from one feeding ground to another. In the evenings I have viewed endless flocks winging their way home to roosting sites many miles up in the hills. Rarely, I have also seen them roosting in giant mango trees that have stood their own for probably more than a hundred years.

At sunrise they can be seen making for harvested paddy fields where they feed on grain that is left behind and lies strewn all over the place. Should you surprise a flock at dinner time, all the birds will immediately rise with a clatter of wings but having gained sufficient height, they very quickly orient themselves and fly fast and direct to the next feeding ground that may lie a few miles away. They have also been noticed feeding on clover, weeds, and acorns. Post-mortem examination of crops of birds that I shot some years ago,

revealed huge quantities of acorns on which they had been feeding. I marvel at the digestive juices these birds have in their system which makes it possible for them to assimilate overnight, the hard horny acorns which I am sure no other bird would be capable of absorbing.

During March and April, when the birds are breeding, you may see them nesting in trees some 12,000 feet up in the hills. Though at other times the birds flock together and display a highly social disposition, I have seen solitary nests only, and never has any sort of a community breeding station been reported to me. During the early part of the breeding season you may hear the birds calling in a rhythmic cooing voice not unlike "coo-oooh".

In places where the birds are to be seen during the winter migration, wood pigeons, apart from other things, represent a significant element in the subsistence of sport. However, in spite of the fact, and the assumption that a harvested bird is always a dead one, the numbers that are each year shot by sportsmen, in no way pose any threat to the survival of the species, for the birds are wary, and will rarely permit man to get within gunshot range. This not only discourages those who are used to picking sitting birds, but makes slaughter on a big scale impossible. The only way to get them with any degree of certainty is to shoot them on the wing, and even then it is a tricky business since the abnormal size of the bird is not muted by height and distance. It requires a reasonable degree of experience, to calculate the necessary range and allowance before one pulls a shot.

In spite of all this, I have noticed a gradual decline in the numbers that visit the Doon valley. No longer do I find flocks of fifty or eighty birds. Only a few straggling flocks of not more than a dozen birds each, may be seen today. The cause for the fall in population is not properly understood, for apart from the few birds that fall to sportsmen every year, and an occasional one that is captured by the wild goshawks, though not many are killed in this way as they are on the whole capable of outflying most predatory birds, they have no other natural enemies.

Hope Still Survives in the North

By

ARJAN SINGH

(Reprinted from the Statesman)

Tigers have a high reproductive potential. In zoos where the cubs are usually removed from the mother at birth, one litter per year is common. One tigress at London Zoo had three litters in one year and a mean 28 days elapsed between removal of young and the return of oestrus. Thus she was potentially able to have a litter every five months.

A tigress will normally parturate between the ages of three and four, and allowing for a breeding capacity of up to 18 years, will have 14-15 years of cub-bearing. Seven foetuses have been found in tigresses, and cubs up to five are fairly common, and if the mortality can be controlled in captive animals a high procreative potential is evident.

Population dynamics are, however, considerably affected by other factors in free living conditions. Though the tiger and lion have a comparatively short gestation period of 14 to 16 weeks, the cubs are dependent on their mother for a period of $1\frac{1}{2}$ to 2 years. Schaller in his intensive study of the lions of the Serengeti states that a lioness had a second litter after 21 months, but their social interdependence, wherein the lioness will suckle other cubs besides her own, and also the sharing of skills would make this possible. In the case of the tigress this social security does not exist and she is entirely on her own.

Again, one of the roles of the male lion is to ensure the safety of the pride's territory and the safety of its members. Schaller further states that the pride which lost one of its males had little success in rearing its young and of 26 born over a period of 2 years only two survived. The male tiger does not fulfil this function, and the tigress will endeavour to keep her cubs at a distance from the male while they are very young.

The tigress residing near my farm has had three litters over the last ten years. Of the first litter, three females were seen with the mother and used to keep her company till about 2 years of age. Thereafter one tigress remained in the vicinity and two moved out elsewhere. Of the second litter a male and a female were noticed, but only the male survived. Of the third, also a male and female, the male was killed, presumably in an altercation over a kill and the female has not survived. This limited observation, besides showing that the male tiger may pose a threat to its young, also indicates a three year lapse between litters, which also seems to be the view held by Abramov.

Tigresses make poor mothers on the whole and a 50 per cent survival rate of the lions cubs must be held as a maximum for the tiger considering the additional hazards which the cubs are liable to due to the solitary existence of the mother, and though large conceptions

take place, a high mortality rate is common among the very young. The mother has been known to consume them with the after-birth. Moreover they are susceptible to lung ailments, and it is not usual for a tigress to have more than two to three cubs at heel. Thus, allowing for a 50 per cent mortality and a breeding life of 15 years and a three year lapse between litters, gives a lifetime reproductive potential of 5 to 7.5. Not a very high turnover, especially when adult mortality due to hunting, poaching, poisoning, trapping and other causes may further inhibit these figures.

It is generally believed that tigers have no regular breeding season. In other words a tigress which loses her litter can become receptive after an average of 52 days but normally they breed in November and December, or May and June, but most cubs are dropped in March and April.

Mortality among sub-adults is also common when passing to independence when they may be fatally injured due to inexperienced methods in tackling large prey or by the parent tiger over kills or during the mating season. Tigers may also be killed by wild dogs according to Dunbar Brander, Connell and Anderson. Numerous cases of injuries from porcupine quills are mentioned, though a tiger of my acquaintance made deliberate feint attacks until he was able to grab the rodent by the head. They will occasionally indulge in cannibalism, and in one case a tigress, wounded in the company of a tiger, was killed and eaten by the tiger three days later.

The social set-up of the tiger has been imperfectly studied, and much is still conjecture regarding their social organization. Limiting factors are the areas of dense cover in which they live which makes prolonged observations difficult, and also the general attitude of the chase which has made observations of social interactions incidental and many misconceptions exist. Six and seven tigers have come out together in beats or have been contained in the famous rings of Nepal, whereby tigers are surrounded by large numbers of trained elephants in areas of elephant grass. But these gatherings are entirely fortuitous, initiated by a local abundance of prey species, and soon disintegrate. In fact the only stable relationship is that of the tigress and cubs with whom the male may form a loose attachment whereby operating in the same territory they will come together occasionally.

The other reason for a gathering of tigers may be due to the passage of an oestrus female through several male territories, but on the whole the male-female relationship appears to be so tenuous that it is hardly likely that such get-togethers last for any length of time especially as the atmosphere must be strained to say the least! The tigress, believed to be monogamous, is probably not so as generally the male with a larger territory overlaps that of more than one female, especially as figures seem to indicate a slight preponderance of females in most areas. Specialized research will reveal the degree of association of the tiger with the

tigress, but even over the mating season they appear to associate only briefly, and over kills will feed alternately. The animal who has done the killing will feed first.

The range of the tiger depends on three factors. The availability of prey species, density of the local tiger population, and the overlapping of territory which contains tigresses during the mating season. One of Corbett's maneaters ranged over 1,500 sq. miles and as the territories of maneaters are chiefly the ones which have been delimited by hunters and revenue officials, it has given an exaggerated impression of travel.

Maneaters are necessarily more itinerant as game is usually scarce in the area of operation, and also due to the inherent reaction of human contacts, tigers are liable to range further afield after each kill which in any case is only utilized once. The normal range of a male tiger is in the region of 30 sq. miles in an area which contains a sufficiency of prey species. It is rather less in the case of tigresses and the range of the male may well overlap that of more than one tigress considering the period of non-receptivity while they are cub-rearing.

These ranges in addition to having their resident tigers and tigresses, will have transient males from neighbouring territories as well as males whose wanderings overlap several territories each with its dominant male. These territories may therefore be seen not as "defended areas" but as loose "beats" in which the wanderings of one tiger will frequently overlap that of another. Transients are tolerated by resident males even to the extent of associating briefly together. I have never come across two or more males except of one family at a kill, but this might take place in heavily populated areas.

During six months of the year I tie up a buffalo bait regularly in a certain area and have observed the following reactions. If the transient male B from the neighbouring area kills, he will vocalise on approaching and leaving the kill site. The resident A, though larger than the transient, will not approach the kill. The transient C, bigger than the resident but old and lame in the left fore-foot, killed a bait and fed without interference. A few days later he approached the bait site, and was attacked by the resident male who had already killed. There was a certain amount of blood, hair and excreta lying about and obviously the transient had been driven off. Some days later the transient C killed at the site again, and was interrupted while feeding by the resident A. C moved off and the resident then fed on the kill. C did not return to the bait site again, but these interesting interactions were interrupted when the tigers strayed out of the sanctuary and were shot by a shikar outfitters company. The behaviour pattern emerging is that residents are tolerant of transients even to the extent of their hunting in select areas. Animals past their prime and handicapped by wounds become wanderers, periodically rejected by the resident male.

Ranges which have been vacated for one reason or the other are occupied more or less immediately, presumably from the "waiting list" of transients who have no fixed territory, and the places of A and B have already been filled. The tigress does not normally associate

with the tiger at these kills, and if she kills she will feed the first night and then abandon the kill to the tiger. They will not feed together and when cubs are present the tigress may bring them within 50 yards but will not feed. The association at a kill led to the known death of one fully grown cub. The tigress may prefer other wild game of which there is a plentiful supply and scarcity conditions might modify such independence, but the brief association of the male and the female of the species leaves one with the impression of a solitary and unsocial animal, tolerant of its own kind once dominance is assured, and respecting the first rights of the killer for his or her prey, but terribly intolerant at feeding time and in the defence of its legitimate kill.

Two of the main causes of the disappearance of the tiger from much of its former range are the massive destruction of habitat making way for the plantation of exotic and quick yielding timbers without any shade capacity, and the uninhibited demand for skins both as trophy material and by international furriers for the manufacture of rugs and coats, whereby hunting, poaching, poisoning, trapping, and netting are all means to an end. The IUCN meeting in New Delhi strongly recommended a moratorium on tiger hunting and though many states have applied a ban for a varying number of years some states are dragging their feet, and some indeed are having second thoughts.

South India has almost lost the tiger, but we can still save the tiger of the north if we can control the export of skins. The kingdom of Nepal poses a direct threat to the operation of any ban. The long border of 800 miles is mainly tiger habitat and almost entirely uncontrolled by any effective checkpost. Indian citizens do not need a passport for entry and many Indian citizens have shops and other business commitments in Nepal. The way is clear unless they can be persuaded to enforce the ban on tiger hunting also. Their position is worse than ours and their forests, once the ultimate home of the tiger, have been so exploited that beyond isolated pockets in central and perhaps western Nepal, the tiger is virtually extinct.

Winter Track Count of Palamau National Park—Some Suggestions for Refinement

By

S.R. CHOUDHURY,

S.R.O. Wildlife Education Course

Shri J. Mishra, deserves to be congratulated for his initiative in trying methodically to obtain some valuable basic data on wildlife, which is so essential for their management.

However, I have some suggestions for future refinement of the strip sampling technique which has been done in Palamau National Park.

1. Break up the strips into 100 or 200 metre lengths and serially number these sections prominently in the field. Each sighting of the animal or animals should be noted against the corresponding number of the section in the strip. The time of each sighting should also be recorded. These will help in placing the species structure, dispersal and niches in the map and stratify the community patterns. The distance-time record will provide aid in eliminating suspected duplication—pigs in track Nos. 19 and 20 for example.
2. The average and maximum sighting distance—i.e. the width of a strip—should be assessed for each strip to give the population densities which can be projected over the entire Park, less the areas of hills which have been excluded from the purview of the strips.
3. Animals seen on hillocks—evidently outside the strip widths—give interesting information although these should have no bearing on the sampling results. The bias of the hillock could never be an annually repeatable property of any population behaviour to proportionately synchronise with every sampling. Inclusion of such figures, as has been done, may show false trends.
4. Strip sampling of the type applied here, should emphasise only the population trends in cheetal (spotted deer), sambar, barking deer, wild boar, gaur and peafowl. A large population with adequate and regular dispersal or diffusion pattern, can have the resilience—balancing plus and minus—either to be proportionately seen in the strips or to repeat similar disproportioned frequency in successive samplings. This would obviate distortion of the trend.

5. Densities of small and erratic populations can only be guessed from local experience. 12 wolves were seen last year and only one this year during sampling. Who knows how many remained screened in the 300 to 400 metres wide forests between strips. Such chance sighting of a sporadic species like the wolf does not by comparison establish that there has been a "serious decrease" in number. It only means that no wolf except one was seen this year just as no wild dog was seen last year as against the 9 seen this year. Would this lead to the conclusion that there had been a serious increase in wild dogs? This would appear contradictory to the population trend in the ungulates?
6. The cost break-up shows, investment on clearance of lines Rs. 1,105 and wages Rs. 310. A further Rs. 300 or better still, Rs. 600, may provide for a second or third replication on successive days to get a more reliable average. This is necessary because we are dealing with moving objects with some known and many
7. It would be necessary to take one representative strip in each Census Block for repeated sampling—between 7 A.M. to 10 A.M. and again perhaps 3 hrs. in the late afternoon—for about 10 successive days, to assess the order of variances and thus the extent of reliability. tigers. unknown behavioural properties.
8. Correct application of the Tiger-tracer will show more reliably, the position with

I must draw the attention of the author to the phrase, "Minimum number of wild animals" in his first report. This had led at least one contributor to the "CHEETAL" to use "simple arithmetic" in using the data of the minimum number of ungulates against the evidently near maximum number of tigers, published in the preceeding issue, to assume that all the ungulates would be eaten up by the tigers before the year was out. "Simple arithmetic of course misled him because the animals hidden in the intervening 300 to 400 metres wide forests—perhaps 5 to 6 times the total strips area—were not considered in the final estimates. Many like him may also be wondering! It is better, therefore, to confine the deductions to density figures for judging the predator-prey ratios and trends.

IUCN Statement on Banning of Tiger Hunting

Following information received from diverse and numerous sources during its General Assembly in New Delhi in November 1969, the International Union for Conservation of Nature and Natural Resources became convinced that the status of the tiger throughout India had become increasingly precarious and for this reason that all tiger-hunting should be banned. Subsequently, all the Indian States and Union Territories imposed a temporary moratorium on tiger-killing for five years, with the exception of Madhya Pradesh.

This step has been severely criticized by certain parties involved in commercial tiger-hunting. They state that legalized hunting in many cases helps to preserve game species from extinction because, should the species become extinct, this source of revenue ceases, affecting not only the commercial firms catering for sportsmen and other hunters but also the states where the animals occur. In the case of the tiger, these persons point out that the main reason for a decrease in tiger population is destruction of habitat and the cultivation of marginal lands, together with overgrazing and concomitant reduction in the population of those wild ungulates which normally serve as food for the tiger.

The IUCN, and in particular its Survival Service Commission, is fully aware of these and other factors and certainly does not propose to confine its activities to fighting legalized hunting operations. However, under the conditions that exist at present, such hunting might well prove the last straw. To the best of our knowledge, no tiger population exists anywhere in India at the moment which is capable of maintaining itself adequately. To maintain a genetic pool of sufficient variety in a population of animals like the tiger, it is essential that a contiguous population totalling at least three hundred head exists. All known tiger populations in India are, as far as available information goes, of a much smaller number than this, and the areas separating these small remaining populations are of such a nature as to be absolutely prohibitive to regular genetic exchange between them. Hence, the estimated number of two to four thousand tigers still existing in all India is misleading since no single population is large enough to maintain a healthy stock. Furthermore, legalized hunting is, to a large extent, trophy-hunting, and trophy-hunting has a deteriorating effect on the quality of the population, especially if this is very small. A striking example of how trophy-hunting can affect a population of animals which is otherwise not threatened by extinction is provided by the African elephant. Tusks which would have been regarded as practically substandard seventy years ago, rank as exceptionally fine in the present-day population.

Those who have severely criticized the proposed five year ban on all-tiger-hunting have failed to mention the fact that at the same time the Survival Service Commission and the IUCN General Assembly resolved to have a thorough tiger census made throughout India and that the Smithsonian Institution in Washington has granted the money to carry out this research project. If, as a result of this census, it appears that somewhere in India tiger populations of sufficient size to allow sport-hunting on a regular cropping basis still exist, then the IUCN will not be opposed to this. The proposed moratorium is intended only to make it possible thoroughly to assess the situation before it may be too late. It is suggested that Shikar companies may consider turning their attention to organizing photographic or touristic expeditions for viewing tiger. Wildlife viewing is increasingly becoming a lucrative business in many parts of the world; money derived from such source might well be made available as compensation for stock losses to tigers. IUCN would be very happy to assist in offering advice and suggestions.

(By courtesy from the IUCN Bulletin, Oct.-Dec. 1970)

NEWS

Bulletin No. 49—TEXOTICS—of the Texas Parks and Wildlife Department mentions the following faunal species from India which have been successfully introduced and reared in the State of Texas, U.S.A.

<i>Species</i>	<i>Numbers</i>
1. Cheetal	6,450
2. Blackbuck	4,125
3. Nilgai	4,000
4. Sambar	60
5. Barasingha (<i>Cervus duvauceli</i>)	40
6. Thar	4

These are from a list of 26 faunal species which have been introduced in Texas, U.S.A.

Panther On The Tree

(*Anogeisus latifolia*)

By

S.R. CHOWDHURY, I.F.S.

It was late dusk, May 2, 1970. We were returning to the camp with group 'C'—Gaur, Sahai, Naik and Rameswar—of the first batch of Wildlife Education Course, from Andher block to Mundhal camp, along the winding course of Mundhal nadi. Halfway along that sandy track, as we took the short cut across the toe of a spur, Nihar, leading with her flash light, saw the pugmarks first. "There are four sets here", she hailed us, "All fresh on the tyre marks of the last timber truck, and all going the same direction, south to north".

We searched over 100 metres, on each side, up and down the road, to see if there were any pugmarks in the reverse direction. There were none. We, therefore, surmised that these four sets of pugmarks could be of four different animals.—"Perhaps a female with three grown-up cubs"—we started again, down the spur, towards the camp, still 2 kms away.

7.30 P.M. now—again back on the dry bed of the river—almost dark. Suddenly macaque monkeys started chattering excitedly on the right bank. "Let us wait here", I said, "Keep quiet all. Something is going to happen soon". And it did.

A big elastic thud of some heavy things falling from the tree, a suppressed growl and then all quiet again for a long minute or two except the feeble frozen sounds of the monkeys. A second thud, a second growl and then silence again. "Put the light on the tree. The tree is in the direction of the panthers' pugmarks", I said. All flash lights blazed out at once. There were two pairs of bright eyes on the trees, cat eyes for certain. And the next moment all of us were up the steep bank of the nala, towards the tree. One of the cats clambered down out of shooting range—camera only! The other tried to hide behind the branches. Took a quick flash shot before it too slithered into the bush.

No one was convinced that those could be panthers; they appeared so small.

But here it is, in black and white, the back shot of one of those panthers.
Convinced?

नर : शतगुण कामम्

● रमेश बेदी

गरमी में आई हुई शेरनी की मुख्य पहिचान एक खास किस्म की गन्ध से होती है जिसे अनुभवी पालक भी नहीं जान पाता। नर शेर इस गन्ध को दूर से ही ग्रहण कर लेते हैं और शेरनी के पीछे लग जाते हैं। जंगल में तो मादाएं स्वयं नर की तलाश में निकल पड़ती हैं। जोड़ा बनाने के लिये वे जोर-जोर से नर को पुकारती हैं जिसे संवेशन आह्वान (Mating calls) कहते हैं। वे अपने क्षेत्र से बाहर दूर तक नर की तलाश में चली जाती हैं। कुछ दिन तक उनके साथ रह कर फिर अपने क्षेत्र लौट आती हैं। अपने क्षेत्र में एक ही नर गरमी में आई हुई शायद किसी से भी जोड़ा बना लेता है चाहे वो किसी के क्षेत्र में रहने वाली हो या ऋतुकाल में बाहर से आई हो। मादा की चाह के लिए पैदा होने वाली लड़ाईयाँ इन क्षेत्रों में नहीं छिड़ती।

बेचैनी से चक्कर

पशु वाटिकाओं में एक शेरनी के साथ एक ही शेर को जोड़ा बनाने का अवसर दिया जाता है। लेकिन शेरनी की गरमी की गन्ध को दूसरे शेर भी जान जाते हैं और वे कामातुर हो उठते हैं, दिन भर उनकी संवेशन आह्वानें जारी रहती हैं। कोठरी में बन्द ये शेर बाहर की काम लीला को देख तो नहीं पाते लेकिन ज्योंही काम-कलह की आवाज़ सुनते हैं खाना पीना छोड़ कर बेचैनी से चक्कर लगाने लगते हैं और मादा का आवाहन करने लगते हैं।

गरमी में आई हुई शेरनी में सबसे मुख्य लक्षण मैंने नर की चाह देखी है। सम्भोग होने से पूर्व उसकी पूँछ प्रायः उठी रहती है। वह बार बार पेशाब करती है। पक्के फर्श पर हो तो शेर उसको थोड़ा-थोड़ा चाटता है। पेशाब मिट्टी में किया गया है तो वह उस जगह अपनी शृंथनी गाड़ कर पेशाब से सनी हुई मिट्टी को मल लेता है। ढोरो में पेशाब पीने के बाद नर जैसे देर तक नाक भों सिकोड़े हुए दाँत निकाल कर अजीब सी मुखाकृति बनाये रहता है, शेर भी वैसे ही करता है। मैथुन कर लेने के बाद ये लक्षण समाप्त हो जाते हैं। पहले समागम के समय की जाने वाली कामचेष्टाओं में यह भी है कि नर दाँतों के द्वारा मादा की गरदन के ऊपर से पकड़कर धुर-धुराता हुआ उसे बैठने के लिये राजी करना चाहता है। मादा का योनि-द्वार गीला सा सूजा हुआ सा और पहले की अपेक्षा अधिक खुला हुआ रहता है। संवेशन काल की सारी अवधि में ये लक्षण इसी प्रकार बने रहते हैं।

ग्यारह दिन तक जोड़े में

बन्दी-जीवन में जोड़ा बनाने के कुछ उदाहरणों का मैंने अध्ययन किया है। इन में से दो का संवेशन काल (Mating period) सात-आठ दिन था। एक का आठ दिसम्बर से बारह दिसम्बर, १९६६ तक रहा। इस उदाहरण में शेरनी गर्भित नहीं हो पाई। आठ दिन तक जोड़ा बनाने वाली शेरनियों ने यथा समय बच्चे पैदा किये एक जोड़े का संवेशन काल छह दिसम्बर से सोलह दिसम्बर १९६७ तक पूरे ग्यारह दिन रहा। इस उदाहरण में मैंने नर को अक्षम पाया था। यद्यपि नर और मादा दोनों ही समान आयु लगभग तेरह वर्ष के थे परन्तु नर में ढलती जवानी के चिह्न प्रकट होने लगे थे। उसकी खाल का रंग फीका पड़ गया था जबकि मादा की खाल चमकीली और तरोताजा थी। मादा के डिम्बकोषों के साथ नर के शुक्राणुओं का संयोग हो जाय तो मादा गर्भित हो जाती है। कुछ पालकों का मत है कि संवेशन की अवधि मादा के फलित होने पर ही निर्भर करती है। यदि यह कार्य दो दिन के अन्दर ही सम्पन्न हो जाय तो जोड़ा बनना बन्द हो जायगा, शेरनी अलग चली जायगी। कुछ व्याघ्र-युगल ऐसे होते हैं जिनका हरेक संवेशन-काल सात-आठ दिन रहता है।

इशारा पाते ही

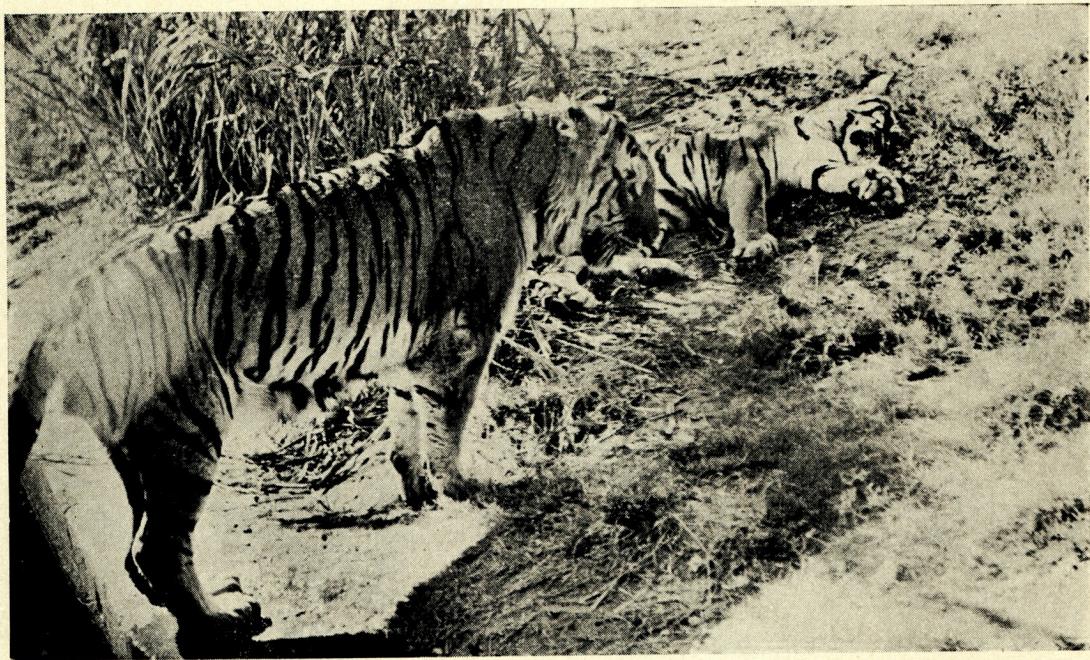
संवेशन में मादा की अपेक्षा नर को मैंने अधिक क्रियाशील देखा। एक बार मैथुन कर चुकने के बाद मादा अक्सर पीठ के बल लेट जाती है, उसकी टांगें आसमान की ओर रहती हैं। इस अवस्था में उसकी योनि का खुला हुआ द्वार स्पष्ट दीखता है। कई बार वह दांयी या बाईं करवट लेट जाती है। उसकी चारों टांगें एक ही तरफ को रहती हैं। इन दोनों स्थितियों में शेरनी को जोड़ा बनाने के लिए अनिच्छुक समझना चाहिए। मादा का उलटा लेटना सम्भोग में परितुष्टि की निशानी समझी जाती है।

काम के आवेश में आये हुए नर की हालत इस समय दयनीय होती है। वह चित्त पड़ी हुई मादा की पूंछ के पास जा कर खड़ा हो जाता है, मादा से संकेत न मिले तो नितम्बों के बल वहीं बैठ जाता है, या चक्कर लगाता रहता है। मादा से दो-तीन गज की दूरी से अधिक दूर नहीं जाता। उसका लिंग कभी-कभी बाहर निकलता है। लिंग की नोक से बून्द-बून्द सफेद स्वेच्छ द्रव टपकता रहता है। एक और बात पर भी मैंने ध्यान दिया कि पूंछ को ऊपर उठा कर वह बार-बार पीछे की ओर बेशाब की एक बौछार छोड़ता रहता है। प्रतीक्षा की इस घड़ी में वह मादा की ओर टकटकी लगाये रहता है। जरासा इशारा पाते ही वह मादा के ऊपर आ जाता है।

नर : शतगुण कामम्

किसी काम शास्त्र का वचन 'स्त्रियः अष्टगुणं कामम्' शेरों के मामले में एकदम उलट है। यहाँ तो नरः शतगुणं कामम् ही सही है। अपने अध्ययन के अन्तर्गत एक जोड़े के नर के बारे में तो मैं कह सकता हूँ कि मादा की ओर दस से चालीस बार बढ़ने के बाद कहीं एक बार वह अपने इरादों को पूरा करने में सफल होता था। खाने में इस की दिलचस्पी खत्म हो चुकी थी जोहड़ इससे कुल दो-तीन गज की दूरी पर था। प्यास बुझाने के लिए वह पिछले पैरों से पानी में उतरा और लगातार मादा को देखता रहा। कुछ घूँट पानी पीकर व तुरन्त मादा की ओर बढ़ा।

मादा की ओर से आँख के इशारे द्वारा सम्भोग के लिए आमन्त्रित किया जाता है। लेटने की स्थिति में जरा



काम के आवेश में आए उस नर की हालत दयनीय होती है ।



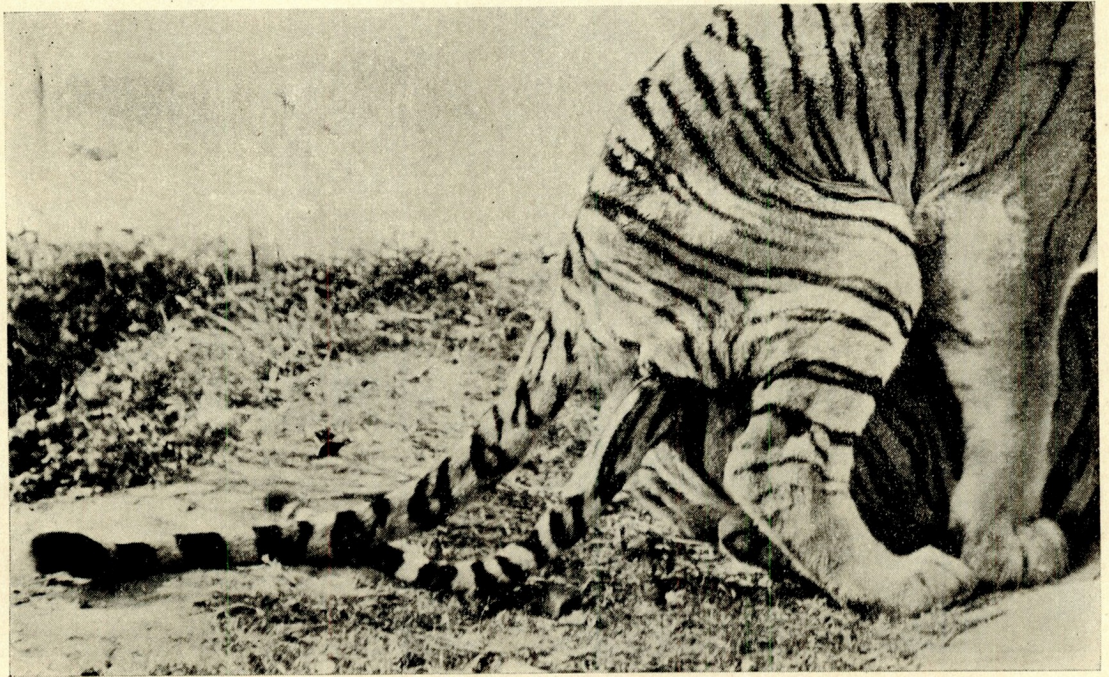
Tigress in "heat" urinates repeatedly.

सम्भोग होने से पूर्व तक उसकी पूंछ उठी रहती है और वह बार-बार पेशाब करती है ।



During actual mating the tigress sits down with her belly and chest touching the ground, all the legs also rest on the ground.

रतिकर्म आरम्भ करने से पूर्व या उसकी समाप्ति पर नर और मादा दोनों या उनमें से एक घुरघुराता है ।



The male strokes with interrupted movement of his hind portion.

मैथुन को पूर्ण बनाने के प्रयत्नों में नर के पिछले शरीर को रूक-रूक कर चेष्टाएं करनी पड़ती हैं ।

सी तबदीली होते ही शेर आगे बढ़ता है। मँथुन करने की स्थिति में शेरनी पेट और छाती को धरती पर टिका कर बैठ जाती है, उसकी चारों टाँगें ज़मीन पर टिकी हुई होती हैं। लेटी हुई अवस्था से जब वह इस स्थिति में आने लगे तो यह मँथुन करने का निश्चित संकेत होता है।

फिर भी प्रताड़ना

मँथुन करते समय शेर गरदन या सिर के ऊपर से शेरनी को अपने दाँतों से हल्का-सा पकड़े रहता है। शेर के चारों पंजे ज़मीन पर टिके रहते हैं। रतिक्रिया आरम्भ करने से पूर्व या उसकी समाप्ति पर नर और मादा दोनों या उनमें से एक घुर-घुराता है। यह घुड़कना शेरनी की ओर से अधिक होता है जो सम्भवतः अपूर्ण या मिथ्या योग के कारण नर की प्रताड़ना कर रही होती है। ऐसे मौके पर शेर उच्चक कर दायें-बायें कूद जाता है। कभी-कभी तो मादा पंजा फँला कर बाकायदा चोट करने दौड़ती है। शेर भी गुर्राता हुआ दो चार कदम पीछे हट जाता है और यह काम-कलह शान्त हो जाता है। जिसमें भूकृटि को तान कर दाँतों और पंजों से वार किया जाता है और एक दूसरे पर घुड़कने से बड़ा शोर गुल मचता है।

संवेशन में मादा की तसल्ली होती जा रही है तो वह घण्टों एक ही जगह लेटी रहेगी और बीच-बीच में नर को ग्रहण करती रहेगी। यदि वह नर को अक्षम पाती है तो उस जगह को छोड़ कर जाने लगती है। शेर तब उसका पीछा करता है और उसे रोकने की भरसक कोशिश करता है।

खाने में भी दिलचस्पी जाती रही

संवेशन-काल में भोजन के प्रति मादा की रुचि पहले के समान ही रहती है। खाना लाने की ट्रीली का आवाज़ को सुनकर वह उठ खड़ी होती है और पिंजरे की ओर देखती हुई जाली के साथ चक्कर लगाने लगती है। वह नियमित रूप से अपने हिस्से का पूरा गोشت खाती है। गोشت खाते वक्त भी नर का ध्यान मादा की ओर होता है। अनेक बार मैंने देखा कि कामातुर नर मुख के नीचे पड़े ताजे गोشت को देखते तक नहीं। शुक्रवार को शेरों का खाने का नागा रहता है। शनिवार को दोपहर बारह बजे जब खाना दिया गया तो जोड़ा बनाता हुई मादा तो झट लपकी परन्तु दोनों कामातुर नर बेचैनी से अपनी कोठरी में चक्कर लगाते रहे। इनमें से एक तो मादा का जोड़ीदार था और दूसरे को अभी जोड़ा बनाने का अवसर नहीं मिला था।

एक सौ इकास्सी बार

काम के आवेग में आये हुए व्याघ्र-युगल को भी दूसरे शेरों के समान रात अलग-अलग पिंजरों में बन्द करते हैं। इस लिए रात को इन्हें जोड़ा बनाने का मौका नहीं मिलता। सुबह आठ-नौ बजे इन्हें मिलाया जाता है। पहले ये एक दूसरे को सूँघते हैं। उस समय शेरनी अत्यधिक कामावेग में होती है, झट पेट के बल बैठ जाती है। नर तो पहले से ही इस अवसर की प्रतीक्षा में रहता है। इन कामियों के दिन का यह आरम्भ होता है। पशु-वाटिकाओं के रिकार्डों से ज्ञात होता है कि एक दिन में ये छब्बीस बार तक भी सम्भोग कर लेते हैं। आठ दिन के संवेशन काल में ग्यारह-बारह बरस के एक युगल ने एक सौ इक्कासी बार सम्भोग किया। एक दिन सुबह सवा आठ बजे उनका पहला सम्भोग रिकार्ड किया गया, रात को १०-४८ पर वे छब्बीसवीं बार जोड़ा बना रहे थे। उसके बाद उन्हें अलग-अलग बन्द कर दिया गया। इस युगल को संवेशन के पहले दिन ७-०६ बजे, दूसरे दिन ३-४५ बजे, तीसरे

दिन ३.४५ बजे, चौथे दिन ३.३१ बजे, पाँचवे दिन २.१६ बजे, छठे दिन १०.४८ बजे, सातवें दिन ४.५० बजे, और आठवें दिन ३.४४ बजे अलग-अलग पिंजरों में बन्द कर दिया गया था। यदि इन्हें चौबीस घण्टे की छूट दी जाती तो इनके मैथुनों की कुल संख्या कहीं अधिक होती। परीक्षण के लिए एक रात इन्हें इकट्ठा कर दिया गया। मध्य रात्रि में १२.४५ से सुबह ८.२० तक इन्होंने दस बार जोड़ा बनाया। रात्रि में इनमें काम का आवेग कम पाया गया। दिन रात के चौबीस घण्टों में इस जोड़े ने कुल मिला कर छत्तीस बार सम्भोग किया, यह सिलसिला अगले दिन भी जारी रहा।

हर ढाई मिनट बाद

इस अध्ययन में यह भी नोट किया गया कि हरेक मैथुन में नर और मादा कितनी देर जुड़े रहते हैं। कुल १८१ मैथुनों में यह व्याघ्र-युगल एक सौ बीस मिनट और सत्तावन सेकण्ड रतिकर्म में प्रवृत्त रहा। एक बार के मैथुन में कम-से-कम पाँच सेकण्ड लगते थे। सम्भोग का सबसे लम्बा समय आठ मिनट पन्द्रह सेकण्ड रिकॉर्ड किया गया। १८१ बार की औसत निकाली जाय तो नर उन्तालीस सेकण्ड प्रत्येक बार मादा से संयुक्त रहा। मैथुन को पूर्ण करने के प्रयत्नों में नर के पिछले शरीर को रुक-रुक कर चेष्टाएँ करनी पड़ती थी। हर चेष्टा में वह प्रायः आठ बार हरकत करता था। नर का पिछला भाग जब इस तरह हरकत में होता है तो मुँह से वह मादा की गरदन को पकड़ कर थामे रहता है। कई बार मैंने देखा कि इन हरकतों की संख्या बारह तक भी पहुँच जाती थी। पन्द्रह बार से ऊपर यह संख्या कभी नहीं गई। इसके बाद कुछ क्षण रुक कर फिर पिछली देह सचेष्ट हो जाती थी और मुँह से गरदन पकड़ ली जाती थी। नर के क्षरण होने तक यह क्रम चलता था।

आठ दिन के संवेशन काल में यह जोड़ा केवल ५४ घण्टे एक साथ रहा। इतने समय में १५८ बार सम्भोग का अभिप्राय है कि ये औसत हर ढाई मिनट बाद जोड़ा बना लेते थे। नीचे की तालिकाओं में इसका विवरण देखिये।



The female signifies her consent for intercourse by a motion of the eye.
 मैथुन करते समय शेर गरदन या सिर के ऊपर से शेरनी को अपने दांतों से हलका सा पकड़े रहता है ।



मादा को तसल्ली होती जा रही है तो वह घण्टों एक ही जगह लेटी रहेगी और बीच बीच में नर को ग्रहण करती रहेगी ।



Tigress often lies sideways, to the left or to the right. In such postures the tigress seems unwilling for further intercourse.

मादा और अधिक मैथुन के लिये तैयार नहीं है ।



Panther on the tree.

(Refer Page No. 48)

तालिका एक

१६-११-६६	१७-११-६६	१८-११-६६	१९-११-६६	२०-११-६६	२१-११-६६	२२-११-६६	२३-११-६६
बजे मि०से०	बजे मि०से०	बजे मि०से०	बजे मि०से०	बजे मि०से०	बजे मि०से०	बजे मि०से०	बजे मि०से०
१ ६.००	८.४५	१.५	८.३०	२०	८.२२	३.००	६.११
२ ६.१५	१०.४०	१०	८.३५	१५	८.४६	३०	६.१५
३ ६.२०	११.०४	७	८.४५	१०	८.००	२०	६.३५
४ ६.३०	१२.००	५	८.००	२०	८.३५	२०	१०.००
५ ६.५०	१२.२०	१.००	८.१०	२०	८.४१	४५	१०.४५
६ ११.१५	१.०४	१.५	८.१५	२०	१०.०५	३०	११.१०
७ ११.४५	१.२०	१.०	८.२५	२२	१०.३७	२०	११.३४
८ १२.००	१.३०	१.५	८.५०	२०	१०.५५	२०	११.४५
९ १२.३०	१.५५	१.००	१०.०४	१२	११.१५	१.३०	१२.०६
१० १२.४५	२.००	१.५	१०.१५	१२	११.२८	१.१५	१२.२५
११ १.००	२.४५	१२	१०.२५	१५	११.४२	२.००	१२.५२
१२ १.००	३.२५	०४	११.३५	१०	१२.००	२.००	१.१५
१३ १.४०	३.३५	२०	१२.१२	१२	१२.०५	२०	२.००
१४ २.३०	३.४५	१०	१२.५२	२२	१२.२०	३०	२.१६
१५ २.४२	४.१८	१.०४	२५	१२.४५	२५	१०.२६	६.४०
१६ ३.१०		१.३७	२२	१२.५२	२०		८.५०
१७ ३.१५		१.५४	३०	१.११	३०		८.०४
१८ ३.३०		२.३२	३०	१.२०	१५		८.१५
१९ ५.१०		२.४६	१.३०	१.५४	१.००		८.२०
२० ५.२४		३.२२	१.००	२.२५	२०		८.३०
२१ ६.००		३.३०	४०	२.४५	३०		८.३७
२२ ७.०६		३.४५	३०	३.१५	४५		८.४५
२३			६.०७	३.३१	१.२०		८.४८
२४				१६.२५			१०.२१
२५							१०.३०
२६							१०.४८

तालिका दो

संवेदन की तिथी	कितने घण्टे इकट्ठे रहे	कितनी बार सम्भोग किया	कितने समय तक जुड़े रहे
१६-११-६६	१०	२२	६ मि० १० से०
१७-११-६६	७	१४	४ मि० १८ से०
१८-११-६६	७	१२	६ मि० ७ से०
१९-११-६६	७	२३	१६ मि० २५ से०
२०-११-६६	५	१४	१५ मि० २६ से०
२१-११-६६	२४	३६	३५ मि० १ से०
२२-११-६६	८	२३	२१ मि० ४७ से०
२३-११-६६	६	४	६ मि० ४० से०
योग	५४	१५८	१२० मि० ५७ से०

वन्य जीवन संरक्षण

● सी० एल० भाटिया व जे० एच० देसाई

पशु पक्षियों की सुरक्षा से मतलब है कि वन्य के जीवों का शिकार और प्रतिपालन इस ढंगसे किया जये कि इनका वनस्पति-जीवन के साथ कुदरती संतुलन न बिगड़े। वन्य जन्तुओं की सुरक्षा करना हमारी बड़ी पुरानी परम्परा है। जन जीवन के विकास के लिये वनस्पति और जीवजन्तुओं के संरक्षण और संतुलन आवश्यक है। पशुओं की सुरक्षा की भावना को बड़ी धार्मिक महिमा दी गई है। जैसे हाथी गरुड जी का रूप, गरुड भगवान विष्णु के वाहन, शेर दुर्गा का वाहन भैरव यमराज का वाहन, और उल्लू लक्ष्मी का वाहन माना गया है।

हमारे देश में कुल मिला के ५०० से अधिक जाति के जानवर २००० से अधिक जाति के पक्षी और ३००० से अधिक किस्म के कीड़े मकोड़े पाये जाते हैं।

पशु पक्षियों की सुरक्षा करने की हम सोचते हैं तो हमें एक आशंका जरूर होती है कि जंगली जानवरों से खेतों को बहुत ज्यादा हानी होती है। खेतों के पास रहने वाले पशु पक्षी खेतों को बहुत ज्यादा नुकसान पहुंचाते हैं। फिर क्यों की जाये। आइये इस पर विचार करें।

दुनिया में सबसे पहले वनस्पति, फिर पशु पक्षी और अन्त में मनुष्य आया। आदमी ने अपनी बुद्धि के सहारे वनस्पति पशु पक्षी तथा अन्य जीवों पर अपने लाभ के लिये नियन्त्रण किया यह नियन्त्रण इतनी तेजी से हुआ कि इससे कुदरती संतुलन टूटने का खतरा हो गया। और आदमी को अपना अस्तित्व को भी खतरा होने की सम्भावना पैदा हुई। हमें इस कुदरती सम्पत्ति का इस प्रकार उपयोग करना चाहिये कि हमें इनसे लाभ पहुँचता रहे और वह हमारे मध्य से अलोप न हो जायें।

एक बार मदरास राज्य में साँप इतने बढ़ गये कि इनको मारने के लिये एक बड़ा अभियान चला, परन्तु साँपों के विनाश से चूहे इतने बढ़ गये कि खेती तथा मनुष्यों को खतरा पैदा हो गया। इसी प्रकार चीन में गोरईया चिड़ियों को मारने का अभियान चला जिससे कीड़े मकोड़े इतने बढ़ गये कि फसलों को बहुत नुकसान हुआ। इस लिये बिना सोचे समझे कुदरती संतुलन को नष्ट करना अपने पैर पर खुद कुल्हाड़ी मारता है।

पशु-पक्षियों का संरक्षण हमारे लिये बहुत जरूरी है। पक्षी खेती को कुछ नुकसान जरूर पहुँचाते हैं, परन्तु वह हानि इनके लाभ के समक्ष नगण्य है। पक्षी हानिकारक कीड़े मकोड़ों को खाकर इनसे फसल की रक्षा करते हैं।

ऐसा अनुभव करते हैं कि यदि संसार के सब पक्षियों का नाश कर दिया जाये तो कीड़े मकौड़े इतने बढ़ जायेंगे कि दस वर्ष में विश्व में वनस्पति का नाश हो जायेगा। और वनस्पति के बिना मनुष्य का जीवन सम्भव नहीं है। यह तो आप जानते ही हैं की पक्षी वनस्पति के बिजों के विवरण में भी सहायता देते हैं। जिस प्रकार पक्षी वनस्पति के नाश करने वाले कीड़ों को खा लेते हैं। उसी प्रकार शेर इत्यादि हिरन और बन्दर जैसे जानवरों को खाकर खेती को नुकसान पहुँचाने से बचाते हैं।

जंगली जानवरों की सुरक्षा की भावना हमारे देश में प्राचीन काल से चली आ रही है, हमारे धर्म-शास्त्र जीव जन्तुओं के प्रति प्रेम और अहिंसा की कथाओं से भरे हैं। गौतम बुद्ध का घायल हंस के विषय में विवाद बहुत प्रसिद्ध है। महाराज दिलीप ने सिंह से मांदिनी गाय की रक्षा, तथा महाराज शिव ने बाज से कबूतर की रक्षा करके अपने शरीर को अर्पण में गौरव का अनुभव किया था।

जंगली जानवरों के संरक्षण से यह मतलब नहीं कि इन का शिकार बिलकुल बन्द कर दिया जाये। इसका मतलब है कि शिकार इस प्रकार किया जाये कि इनकी वांछित संख्या में कमी न हो।

हमारे देश में सम्राट अशोक ने पशु-पक्षियों की सुरक्षा के लिये कुछ नियम बनाये थे, उनके बाद के भी राजाओं ने भी वन-पशुओं की सुरक्षा की ओर ध्यान दिया। मुगल सम्राटों ने अपने शिकार के आखेट स्थलों को सुरक्षित किया। इस प्रकार परोक्ष रूप से इनकी सुमुचित संरक्षण मिला। सम्राट बाबर पंजाब की तलहटी पहाड़ी तथा पेशावर घाटी तक गेंडे का शिकार खेलते थे। बिहार, बंगाल के पूर्वी क्षेत्रों को छोड़ को गंगा यमुना के पूरे मैदान में शेर पाया जाता था। कहते हैं कि आगरे के पूरे निकट यमुना व चम्बल के बहेड़ों में सम्राट अकबर शेर का शिकार खेलते थे। परन्तु अब गेंडा और शेर भारत में बहुत कम हो गये हैं। इस बहुमूल्य सम्पत्ति को बचाने के लिये शिकार कानूनों में संशोधन किया गया है परन्तु कानून से संरक्षण प्रदान करने के साथ साथ जनता का सहयोग भी इसमें बहुत आवश्यक है।

हमारी सरकार ने इस बहुमूल्य सम्पत्ति के संरक्षण के लिये अनेक कदम उठाये जैसे National Parks तथा Sanatuaries की संख्या बढ़ाई जा रही है जिसमें कि ज्यादा से ज्यादा पशु-पक्षी सुरक्षित रह सकें। हमने अपने देश की कई पशु-पक्षियों की नस्लें नष्ट होने से बचा ली हैं। इस के साथ साथ जिस पशु पक्षियों की जातियाँ नष्ट हो रही थी, वे अब काफी संख्या में बढ़ गई हैं। कई नष्ट होने वाली पशु-पक्षियों की जातियों को अच्छे चिड़ियाघरों में रखकर उनकी संख्या बढ़ाई जा रही है। ताकी जब संख्या बढ़ जाये तो इनको अनुकूल स्थानों और जंगलों में छोड़ दिया जाये।

इनके अलावा जन-मत जागृत करना भी जरूरी है। इसलिये शिक्षा-संस्थाओं में पशु-पक्षियों के बारे में बातें बताई जाये, ताकि बच्चों का उनके प्रति प्रेम बढ़े। पशु पक्षियों के बारे में हमारे देश में जन सामान्य के लिये बहुत कम साहित्य है, यदि इस साहित्य को बढ़ाया जाये तो लोगों में पशु-पक्षियों के लिये अच्छी भावना होगी और उनका नाश होने से बचेगा।

लोगों को पशु-पक्षी के बारे में आकर्षित करने के लिये संगठन बनाये जायें, जिससे उनकी जंगली जीवों के प्रति रुचि बढ़े। ऐसे कई संगठन हमारे देश में हैं जिससे काफी लोगों ने लाभ उठाया है।

वन्य प्राणी सप्ताह जो कि हर साल सारे देश में मनाया जाता है उससे भी उस भावना को सहारा मिला है, परन्तु जनता को शिक्षित करने की और भी जरूरत है, खास करके गाँव के लोगों को इस भावना के

प्रति शिक्षित करना और भी महत्वपूर्ण है। क्योंकि उनका सम्पर्क वन्य जीवों से ज्यादा रहता है। उन्हें फिल्म द्वारा पोस्टरों द्वारा तथा शिक्षा के माध्यम से पशु-पक्षियों की सुरक्षा के सुभाव दिये जा सकते हैं।

युवा पीढ़ी का दायित्व इस बारे में सबसे ज्यादा है, क्योंकि यह लोग आने वाले समय में हमारी यह राष्ट्रीय संध-सम्पत्ति की सुरक्षा का भार उठा सकेंगे।

पशु-पक्षियों का मूल निवास स्थान हरे-भरे जंगल ही हैं, जहाँ वे सुष की नीद सोते हैं। अगर हम वनों को काटना शुरू कर दें तो हम इन पशु-पक्षियों से हाथ धो बैठेंगे। चौकड़ी भरते हुये हिरनों के सुन्दर दृष्य को हम अपने ड्राईंगरूम में नहीं देख सकते।

इन्हीं सब भावनाओं से अभिप्रेत होकर हमारे स्वर्गीय प्रधान मन्त्री श्री जवाहर लाल नेहरू जी ने गर्व के साथ कहा था कि यदि हमारे पास देखने तथा खेलने के लिये सुन्दर पशु-पक्षी न होते, तो जीवन बड़ा ही नीरस और शुष्क हो जाता।

हमारे राष्ट्रीय उद्यानों तथा पशु विहारों में जहाँ शिकार खेलना मना है। देश विदेश से लोग आते हैं, इससे हमें विदेशी मुद्रा भी प्राप्त होती है।

जन स्वास्थ्य की दृष्टि से भी पशु - पक्षी का बड़ा महत्व है। बहुत से जीव जन्तु सफाई करने में मनुष्य का साथ देते हैं। जैसे गिद्धों के समूह मृत पशुओं को थोड़े समय में ही साफ कर देते हैं। अगर गिद्ध का नाश कर दिया जाये तो मृत पशु सड़ कर वातावरण को दुषित बना दें। इसी प्रकार मछलियाँ ब मेंढक कितने ही कीड़ों को खाकर पानी को साफ रखते हैं। इसलिये सफाई की दृष्टि से पशु-पक्षी हमारे लिये काफी लाभदायक है।

इस लिये नैतिक, सामाजिक, सांस्कृतिक, आर्थिक, कलात्मक तथा जन स्वास्थ्य की दृष्टिकोण से पशु-पक्षियों की सुरक्षा हमारे लिये जरूरी है।

आप लोगों से मेरा अनुरोध है कि आप जहाँ भी हों पशु-पक्षियों की सुरक्षा की भावनाओं को बढ़ावा दें।

(सम्पादकीय नोट :— वाइल्ड लाइफ सोसाईटी आफ इन्डिया, देहरादून भारतवर्ष की एक मात्र संस्था है जो इस लक्ष को ओर कार्यशील है आपका सहयोग व सक्रिय भाग वांछनीय है)

FORM IV

(See Rule 8)

- | | | |
|---|-----|--|
| 1. Place of Publication | ... | ... Dehra Dun. |
| 2. Periodicity of its publication. | ... | .. Half Yearly. |
| 3. Printer's Name | ... | .. Tara Chand Sharma. |
| Nationality | ... | .. Indian. |
| Address | ... | ... Dun Printing House,
Rajpur Road, Dehra Dun. |
| 4. Publisher's Name | ... | .. S. Oswald. |
| Nationality | ... | ... Indian. |
| Address | ... | ... Wild Life Preservation Society of India,
7-A, Astley Hall, Dehra Dun. |
| 5. Editor's Name | ... | ... S. Oswald. |
| Nationality | ... | ... Indian. |
| Address | ... | ... Wild Life Preservation Society of India,
7-A, Astley Hall, Dehra Dun. |
| 6. Names and addresses of individuals who own...
the newspaper and partners or shareholders
holding more than one per cent of the total
capital. | | Wild Life Preservation Society of India,
7-A, Astley Hall, Dehra Dun. |

I, S. Oswald, hereby declare, that the particulars given above are true to the best of my knowledge and belief.

Dated : 6-11-63

Publisher:
S. Oswald.

LETTERS TO THE EDITOR

I

Dear Sir,

In my article on the Winter Track Census of Wild Life of Palamau National Park which was published in the Cheetal (October, 1970), no elephants were noticed in the Park and this probably made the editor "raise his eyebrow".

Elephants are seasonal visitors of Palamau National Park. From the Baresand Reserve Forests, which is their home, they cross the river Koel and enter into the 'Park'. They continue in this Park or in the adjoining forests till the advent of summer when they return to Baresand Forests. Last year in winter, elephants strayed away to the Chainpur Forests in the month of November and they continued there till February. Hence they were not present in the Park in the first week of January, 1970 when the Census work was undertaken. This year too, in September, over 35 elephants crossed into the National Park from Baresand Forests and as last year, crossed over to the adjoining Chainpur Forests. By December, 1970, six of the elephants again recrossed into the National Park. These have found mention in the Census Survey conducted on 7th January, 1971.

Yours faithfully,
J. Mishra

*

*

*

*

II

Dear Sir,

Kindly permit me to invite your attention to the following facts in connection with wildlife destruction.

1. Large scale trapping and killing of spotted deer is being done by poachers in Sunderbans. This fact was confirmed by the Secretary of Wild Life Preservation Association of Eastern India, when, in the third week of December, '70, he along with some friends, went to the area. The extent of this practice could be gauged from the fact that in one small corner, viz. the JHAR KHALI area, where the Secretary, Mr. B. Bose, went and investigated, between 700 and 800 spotted deer were trapped and killed in the course of just one year. Some commercial houses in Calcutta are at the back of this horrible destruction: they engage professional poachers to do this dirty job for them. Isn't it disgusting? The matter is being taken up with the State authorities by Mr. Bose, but he is not

hopeful of proper response. Can you do something to save the situation ? Further information can be had from Mr. B. Bose, Secretary, Wild Life Preservation Association of Eastern India, 5, Tiljala Road, Calcutta-46.

2. I visited Chamba (H.P.) recently and went to the higher ridges in Bharmaur region. That area used to be full of Brown bear, ibex, thar, serow, ghooral and even musk deer was not scarce. On many a former visit, I counted as many as thirty ibexes in one herd. But this time it was a great disappointment; very few animals could I see. The area is almost bereft of wildlife. The reason, I am told, is the infection of rinderpest brought to the ungulates of higher pastures by the herds of sheep and buffaloes coming from plains every year for three months in the summer.

This could be effectively checked provided the authorities take some interest. All the domestic animals on their way to higher pastures, have to pass across one of the two bridges: the *Shitala bridge* and the *Chaura bridge*. Both the bridges have a forest checkpost on each to realise the grazing fee. If veterinary personnel could also be attached to these forest posts with instructions that no animal will cross the bridge without inoculation against the rinderpest, the problem, to a great extent, will be solved. They can even charge some nominal fee per head for inoculating the animals. This will cover the expenses the Government will be incurring on posting extra hands.

I earnestly request you to tackle this problem with Himachal Govt. through IBWL or some other competent authority.

With all good wishes for a happy New Year.

Your sincerely,
Sher Jung.

*

*

*

*

III

Dear Sir,

It is most unfortunate that a biased article "*Tiger—a predator which costs under-privileged jungle villagers of India Rs. 60 million annually*" has been given importance and published in our Journal. I do not think it was wise on the part of the Editorial Board to have accepted such an unfounded article which contains incorrect, irrelevant and misleading information from beginning to end. The article indicates that the author lacks fundamental information on tigers and, probably, has always seen through the sight of the rifle not the tigers but dollars. If comments were to be published, they should have been point by point to Mr. Imam's letter to the Prime Minister.

My comments on the article and its reply are that they do not deserve any comments.

Yours faithfully,
(K.S.) Sankhala)

Member, Wild Life Preservation Society of India.

I

Open letter to the Chairman,
Indian Board for Wild Life,
New Delhi.

Subject:—Note on a centrally administered Wild Life Service

Sir,

There are two main reasons for a centrally administered Wild Life Service in charge of parks and sanctuaries. The need is so urgent that unless immediate action is forthcoming, species like the tiger and leopard may be written off

- (i) Attitude of the State Forest Department to Wild Life.
- (ii) Political pressures.

The Forest Department has always been commercially oriented.

In addition to the exploitation of major timber species, they ascribe a rupee value to minor timber, fishing rights, monkey catching, cattle grazing, honey collecting, 'Khas' thatching, manure, drift wood, and any other forest produce which a fertile imagination can harness to revenue purposes. Wild Life revenues are from sale of permits and royalties on game.

The attitude of the parent body is not only of general non-co-operation but often of active hostility to the wild life effort. Forest contractors and dwellers in forest areas are conscious of the stoppage of the sale of certain produce in parks and sanctuaries, and the nuisance value of wild life, and this antagonism has spread to the lower echelons of the forest staff with whom many are related and of which fact they take advantage. Political pressures and inducements are sometimes severe and the commercial hunting of tigers was very nearly reopened in Uttar Pradesh. Forest rules place the onus of proof for timber apprehended outside the Forest on the appellant, but a wild life carcass needs two independent interests for a conviction.

The wild life organisation in Uttar Pradesh is used mainly as a dumping ground for unwanted personnel by territorial conservators, e.g., the Kheri region has had a succession of five sub-standard Wild Life wardens under adverse report from the parent body. This year a Divisional Forest Officer against whom strictures of financial and other irregularities were passed by the Conservator, was posted as Chief Wild Life Warden and only at my personal intercession with the Chief Minister and the Forest Minister, was he removed.

Timber exploitation takes place unabated in parks and sanctuaries and the massive plantations of Eucalyptus of doubtful future value, gives no shade, no shelter, and no humus, and in addition to denying habitation to wild life will lead to depletion of fertility, to leaching and baking by direct rays of the sun, and to heavy erosion of the soil during the rainy seasons; but it holds future promise of early returns !

Cattle grazing cannot co-exist with wild life due to competition for forage with wild ungulates to the everpresent threat of the transmission of cattle diseases and the burning of forest grasses by graziers which destroys infant animals.

Yours faithfully,
Arjun Singh.

*

*

*

*

II

Open letter to the Prime Minister of India,
New Delhi.

Dear Madam,

You were good enough to do me the honour of nominating me to the Indian Board for Wild Life. I am, therefore, taking the liberty of addressing this letter to you knowing of your great interest and solicitude for the future of wild life.

I have recently been to Calcutta and visited Latif Sons & Co. at 7 Colootola Street, Calcutta-1. I was shown a raw and recently acquired tiger skin and was offered a monthly supply of 50 such skins as Rs. 3000/- a skin. I was also informed that a regular supply of crocodile and python skins could also be arranged. I further visited S.M. Nazir and Brothers at 3/1, Sri Nath Babu Lane, Calcutta-12. The proprietor offered me a monthly supply of 200 leopard skins at Rs. 1000/- a skin—he showed me a lot of 25 skins—20 clouded leopard skins, and innumerable skins of monitor lizards. The latter dealer was within a few hundred yards of the monumental edifice which houses the Forest Department of West Bengal, and I understood that there were other dealers engaged in similar traffic of uncured skins. I also visited Beauty Arts, Furriers and taxidermists in the New Market. They had on open display, head mounted skins of tigers, leopards, clouded leopard, baby leopards and golden cat and panda furs, which are all protected species. I gathered that there was a brisk trade to Nepal and a few skins at a time could also be smuggled through customs for a consideration. I was accompanied throughout by Mrs. Anne Wright, a resident of Calcutta and a devoted protagonist of our wild life.

I raised this matter at the meeting of the IBWL and suggested that a stamp on existing and processed skins was a desirable step towards stopping the proliferation of such articles in shop windows. I was informed that there was no law which would sanction such a course.

Surely, Madam, we can amend a law or enact a new one to knock the bottom out of this revolting traffic which I am convinced has an all—India network. I say with all the emphasis I can command that a theoretical ban is totally ineffective when ranged against such vested interests and the tiger and leopard are going to disappear in spite of the brave words with which we have endorsed the resolutions of International forums.

Nepal also has an open and fluid border and unless we can ask for their co-operation our good intentions are destined to lead to the happy hunting grounds.

While submitting an apology for this ultimate appeal to you I will stress in more detail that when I raised this matter at the meeting of the IBWL I was asked by the Chairman for the solution.

Surely, it is not for me as an individual to provide the solution, also especially when in my single capacity I have unearthed a trade of which the departments concerned are unaware. Ordinances are promulgated on lesser accounts and if trifling legal lacunae are to assist in the disappearance of our first animal we might as well wind up the concerned organisations and devote the proceeds to more urgent nation building tasks.

And finally I might express the fervent hope that political motivations are not responsible for the furtherance of the fur trade of protected species when countries like the United States of America have banned the processing of these skins in the interests of threatened species.

Yours faithfully,
Arjun Singh.

LIBRARY

The following books and publications were added to the Society Library. The Society thanks the donors and requests members to donate more books or money to make the Library more useful.

No.	Name of Book	Remarks
1	2	3
290	Conservation et Arrangement Dn Milien I.U.C.N. Supply paper No. 19 (In French) ...	Complimentary
291	The Twilight of India's Wild Life by Seshadri ..	Donated by Mr D.E. Wilson
292	The Red Book—Wild Life in Danger by James Fisher ...	Donated by Mr Hari Dang
293	Forests and Forestry by K.P. Sagreiya ..	Purchased
294	The Long Safari by John Polard ...	-do-
295	Jiv Jagat (Hindi) by Suresh Singh	-do-
296	The Maneater of Rupaidhia and other stories by Andrew Mc Dean ...	-do-
297	Diseases of Free Living Wild Animals ...	-do-
298	Use Enough Gun by Robert Ruark ...	-do-
299	Ramblings in Tiger Land by Sher Jung ...	-do-
300	Bihar State Rifle Association Souvenir 1969 ...	Complimentary
301	Birds, Beasts and Relatives by Geral Durrel ...	Purchased
302	The Drunken Forests -do- ...	-do-
303	Three Singles to Adventure -do- ...	-do-
304	Encounters with Animals -do- ...	-do-

1	2	3
305	A Zoo in my Luggage by Geral Durrel ...	-do-
306	The Whispering Land -do- ...	-do-
307	Bafot Beagles -do- ...	-do-
308	My Family and Other Animals -do- ...	-do-
309	Menagerie Manor -do- ...	-do-
310	Snakes of the World by John Slidworthy ...	-do-
311	The Man Eater of Malgudi by R.K. Narayan ...	-do-
312	Serengeti Shall Not Die by Dr Grzimek ...	-do-
313	Fishes by M. Chandi ..	-do-
314	Some Thoughts on Mature Socialism by Professor Jan Tinbergen ...	
315	Little Tiger — BIG TIGER by Mrs. Lois Hamilton Fuller	Complimentary
316	Ten Thousand Miles on Elephants by Olive Smythies ...	Purchased
317	Innocent Killers by Hugo and Jane ...	-do-
318	Alive in the Wild by V.H. Cahalane ...	-do-
319	Ecology by Peter Farb ...	-do-
320	Animal Behaviour by Niko Tinbergen ..	-do-
321	UNI the Elephant by S.G. Polhan ...	-do-
322	Chhota Sher Bara Sher ...	-do-
323	Bobhamakka by M. Krishnan ...	-do-
324	Animals of East Africa by C.T. Astley Maberly ...	-do-
325	Eagles by Leslie Brown ...	-do-
326	Tiger in Sight by Astrid Bergman ..	Purchased

THE FOLLOWING JOINED THE SOCIETY DURING 1970-71 ;—

LIFE MEMBERS

- Shri R.B. Saksena, Baldev Niwas, Deokali Road, Faizabad (U.P.)
 Captain Harcharan Singh, Majulighar Tea Estate, P.O. Sootea Darrang, Assam
 Mr. Rajender Bhandari, 19, Teen Murty Marg, New Delhi-11.
 Dr. M.K. Senapati, Senior Consultant Surgeon, Ministry of Health, P.M. Bag 15 — J O S
 NIGERIA
 Mr. James Bola Obebiyi, C/o Indian Forest Colleges, F.R.I. New Forest Dehra Dun.
 Mr. Samson Oja Faniyi, -do-
 Shri Sam Jal Mistry, Manager Kaira Can Co. Ltd. Amol Dairy Compound, Annand
 (Gujarat)
 Brigadier R. Lokaranjan, Chief Engineer, HQ C.E. J. & K Zone, C/O 56 A.P.O.

ORDINARY MEMBERS

- Mr Kai Carry Linoahl, Nordic Museum & Skansen, Stockholm (Sweden)
 Shri S.K. Surana, P.O. Japla Cement Factory, Distt. Palamau (Bihar).
 Dr. B. Franklyn Woods, 49, Denning Road, Jabalpur (M.P.)
 Lt-Colonel R.S. Virk, NCC Group Headquarters, Dehra Dun.
 Mr. Ronald P. Tobin, Tobin Villa Ranjhi Jabalpur (M.P.)
 Mr. R.N. Waller, Thornworthy Chagford, Devon—U.K.
 Mr. Subrata Chatterjee, Larsingat Tea Estate, P.O. Udarband, Cachar (Assam)
 Shri Sarvesh Chandra, C/o Lufthansa, 56 Jan-Path—New Delhi-1.
 Shri Praveen Lal Goyal, C/o F.S.I. Section, Ministry of External Affairs, New Delhi-11.
 Shri S.N. Suri, Agent L.I.C , 12 New Road, Dehra Dun.
 Dr. (Mrs) Tara Chand, 6-A Municipal Road, Dehra Dun.
 Mrs. Ethal C. Martin, 309, Elm. Avenue, Montreal 215 PQ, Chanda
 Shri Ajai Pratap Singh, 1-Dhillon Marg Patiala—Punjab.

PROFESSIONAL MEMBERS

- Shri N.K. Prasad, Gane Warden, Hazaribagh National Park, Hazaribagh (Bihar).
 Shri P.K. Naik, A.S.F., South Shahdol Divn, Shahdol (M.P.)
 Shri Man Mohan Singh, Asst. Wild Life Warden C/o The Conservator of Forests, Chanda
 Circle Chandrapur (M.S.)
 Shri V.T. Patki, Indian Forest Colleges, F.R.I. College, Dehra Dun.
 Shri Hari Narain Tatwadi, Assistant Conservator of Forests, Tilakwadi, Yeotmal (M.S.)
 Shri Bishan Chandra, Wild Life Warden, K.R. 307, Civil Lines, Kota (Rajasthan).
 Shri Vishwa Bhushan Gam, Wild Life Warden, Bundelkhand Region, Jhansi.
 Shri R.C. Sahai, Asst. Conservator of Forests, Daltonganj North Divn, Daltonganj.

Shri G.S. Kandey, Asst. Conservator of Forests, Near Old Power House Chandrapur. (M.S.)

Shri K. Rameshwar, Asst. Conservator of Forests, H No. 22-1-145 Inside Chanderghat, P.O. Sahifa, Hyderabad (A.P.)

Shri R.D. Gadkari, Asst. Conservator of Forests, C/o D.F.O. West Chanda Divn Chanda (M.S.)

Shri A.K. Kraipaf I.F.S., Divisional Forest Officer, J.V. Forest Division Baramulla (Kashmir).

Shri S.K. Seth I.F.S. President F.R.I. and Colleges—Dehra Dun.

The Conservator of Forests, Northern Circle West Bengal Darjeeling.

Mr. P.C. Gagoi I.F.S. Working Plans Officer, Northern Circle, Jorhat (Assam).

The Divisional Forest Officer, Bandendewa Forest Division, P.O. Lakhimpur, North.

Shri M.C. Srinivasa Murthy—C/o Indian Forest College Dehra Dun.

Shri K.A. Shaikh, C/o Indian Forest College Dehra Dun.

Shri S.A. Qureshi -do-

Shri Jai Singh -do-

The Chief Conservator of Forest West Bengal, P-16 India Exchange Place exhb, New C.I.T. Building, Calcutta-12.

Shri S. Prasad, C/o Indian Forest College Dehra Dun.

Shri P.L. Rajkondawar -do-

Shri S.D. Sathe -do-

Shri Fateh Snigh Rathore -do-

Shri A.P. Tripathy -do-

Shri B.M. Chengappa -do-

Shri N.K. Bajpai, Technical Assistant, Kulu Forest Circle, Kulu (H.P.)

Shri R. Mishra I.F.S. -do- Orisa.

The Conservator of Forests, PANJI

EDUCATIONAL MEMBERS

Mr. A Oswald, Indian Forest College, F.R.I. Dehra Dun.

Shri Pratap Singh, Research Officer, F.R.I. P.O. New Forest Dehra Dun.

Dr. K. J. Joseph, Professor and Head of the Dept of Zoology, University of Calicut, P.O. Calicut University (Kerala).

Mr. M.A. Rashid I.F.S. — No. 12 New Forest, Dehra Dun.

Wild Life Preservation Society of India

DEHRA DUN

Patron-in-Chief:—His Excellency Shri V.V. Giri, President of India.

President:—His Highness Maharaja Pratap Singh Malvendra of Nabha.

Executive Vice-President:—S. Ranbir Singh.

Hony. Secretary & Treasurer:—Dr. R.N. Misra

Asstt. Hony. Secretaries:—

1. Dr. S.K. Sangal.

2. The Secretary, Wild Life Club, F.R.I. & Colleges.

Hony. Librarian:—Shri S.M. Osman.

Delhi Branch

President:—H.H. Maharaja Pratap Keshari Deo of Kalahandi.

Hony. Secretary:—Shri Y.N. Gupta.

Assam Branch (Shillong)

President:—H.H. the Maharaja of Charkhari.

Hony. Secretary:—Mr. M.A. Islam, I.F.S.

Bihar Branch (Monghyr)

President:—Kumar Surendra Singh.

Hony. Secretary:—Prof. A.A. Khan.

Editorial Board

1. Shri A. Oswald, IFS (Hony. Editor).
2. Dr. R.N. Misra.
3. Shri R.D. Singh.
4. Dr. S.K. Sangal.
5. Shri S.R. Chaudhury.
6. Shri K.C. Sahni.
7. Shri N.K. Jain.

**Buy from the Hony. Secretary, Wild Life Preservation Society of India,
7, Astley Hall, Dehra Dun.**

	Price
(1) Greeting Cards—in colours with pictures of Peacock, White Tiger, Panther, Pochards, Tiger and Lion. Cards suitable for all occasions. ...	0.75 each
(2) Society's Tie (with Cheetal head in gold on green silk). ...	12.00 „
(3) Society's Writing Pads and Covers (Set of 2 pads with 100 envelopes) ...	11.00 „
(4) Balance of Nature Game (for Members) ...	6.00 „
(5) Society's Cheetal head Lapel Badge ...	2.00 „
(6) Tourist's Guide to Sanctuaries and National Parks in India ...	0.25 „
(7) 'National Parks' by K.S. Sankhala, I.F.S. (Published by W.L.P.S.I.) ...	6.00 „
(8) Singh Parivar in Hindi by M.D. Chaturvedi ...	3.00 „
(9) Panther on the Prowl by M.D. Chaturvedi ...	3.25 „
(10) 'The Felines' (Translation of Singh Parivar) ...	3.00 „
(11) 'Guldar ka Shikar' (Hindi translation of Panther on the Prowl) ...	3.25 „
(12) CHEETAL—I.U.C.N. Special Souvenir Issue ...	5.00 „

Tourism is the world's biggest industry...

... and the fastest growing !

Tourism is a Rs. 11,000 crore world business today. Roughly twice the size of the oil industry. In five years, it will be worth Rs. 18,000 crores ! An almost 75% increase.

Investment in tourism earns the most foreign exchange in the shortest time. For instance, Yugoslavia invested Rs. 56.3 crores in tourism in 1968 and earned Rs. 140.3 crores. A net profit of 250% ! And Spain could build two steel plants like Bhilai each year on her tourism earnings alone !

What about India ?

The number of visitors to India has increased. From 150,000 in 1964 to almost 245,000 in 1969. And our earnings from tourism have gone up to Rs. 33 crores in foreign exchange.

But in terms of world tourism, India got only one out of every thousand world travellers last year. Yet we have just about everything to make India the world's most attractive tourist destination.

What's missing here ?

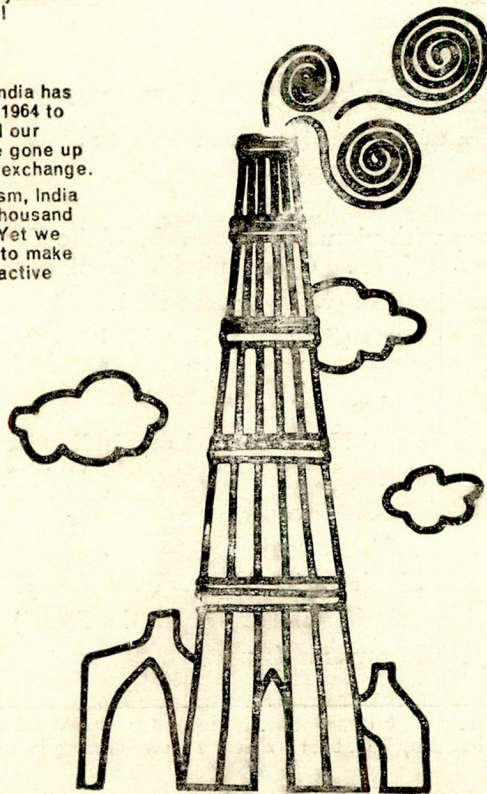
Nothing but broad-based public participation. And enough of what is known as the 'infrastructure' : hotel accommodation, transport facilities and tourist amenities. For instance, the city of Bangkok alone has more hotel beds suitable for tourists than the whole of India !

And when the Jumbo jets come, bringing many thousand more visitors our way, we shall need all these amenities in far greater measure.

What are we doing about it ?

The Government is actively involved in the building of new hotels, improving air and transport services, providing new and better tourist facilities.

But that is not enough. Because Tourism is everybody's business. It involves people at every level all over the country. So join us in our efforts. Let us give the tourist the amenities he needs and see that he goes home happy. Each happy tourist means so many more will come next year. Shouldn't be too difficult for us. Isn't ours one of the world's oldest traditions in hospitality ?



Department of Tourism
Government of India